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REPORT OF THE COMMITTEE ON SOCIAL STATISTICS 1
STATISTICAL ACTIVITIES OF THE UNITED NATIONS
INTRODUCTORY REMARKS William R. Leonard 14
INTERNATIONAL ASPECTS OF ECONOMIC STATISTICS Patrick J. Loftus 15
NATIONAL INCOME STATISTICS J. B. D. Derksen 16
DEMOGRAPHIC AND SOCIAL STATISTICS Forrest E. Linder 19
REFLECTIONS UPON READING MR. EZRA GLASER'S DESCRIPTION OF INTERINDUSTRY ECONOMICS RESEARCH Rutledge Vining 23
RESERVATIONS ON PROFESSOR VININGS'S REFLECTIONS Ezra Glaser 27
NEWS 2, 9, 12
FEDERAL STATISTICAL ACTIVITIES 6
1952 COMMITTEES AND ASSOCIATION REPRESENTATIVES 8
REPORT OF THE ADVISORY COMMITTEE ON STATISTICAL POLICY TO THE DIVISION OF STATISTICAL STANDARDS, BUREAU OF THE BUDGET 10
ECONOMIC FORECASTING—A CHART 11
NEWS ABOUT MEMBERS 13
CHAPTER NOTES 30

APRIL-MAY, 1952
Volume 6, No. 2

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The American STATISTICIAN

APRIL-MAY 1952, VOL. VI, NO. 2

The news publication of the
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Anyone wishing to change their mailing address should allow eight weeks' notice. A copy of the address taken from an issue of the periodical should accompany the change-of-address request.

REPORT OF THE COMMITTEE ON SOCIAL STATISTICS

The Committee has given extended consideration to the establishment of a Section on Social Statistics. It is not now prepared to make a positive recommendation concerning such a Section, but feels that it needs further guidance from the membership of the Association on the need for a Section, subject matter which it might include and the services which members of the Association would like to have it perform. Therefore, this tentative statement is submitted to the Association with the request that members who are interested in seeing such a Section established write at once to the chairman of the Committee giving their views.

Reasons which have been put forward for establishing a Section:

A number of Sections have already been established within the Association. The purposes in establishing them have generally been:

a. To create within the Association working groups that are more homogeneous than the entire membership, and

b. To assure adequate recognition for such a group in the conduct of the Association's affairs, in the planning of the annual program and in the conduct of the publications.

Scope of subject matter fields to be included:

It is felt that there is the requisite degree of homogeneity of statistical methods and problems in these fields to provide a basis for effective functioning of such a Section:

Anthropology	Public Health
Criminology and Penology	Public Opinion and Attitude Research
Demography	Social Psychology
Education	Social Security
Housing	Public and Private Social Services
Political Science	Sociology

This list is not intended as an exclusive list, but rather as an indicator of the core of such a Section. No doubt other interests would be included — for example, the use of statistics in historical research, other than in Economic History, might be included in the field of interest of this Section.

A Section could establish such sub-sections or committees as it finds necessary or useful.

The organization of Sections is not intended to be divisive, but rather to give focus more effectively on the needs and interests of the members. Close cooperation among Sections, and through the Sections with other interested Organizations is presumed.

The Committee would welcome the views of members of the Association on the desirability of and need for such a Section, on the subject matter which it should include; as well as any suggestions for its functioning.

Harry Alpert
Paul M. Densen
Anne E. Geddes
Margaret Jarman Hagood
Morris H. Hansen
Edward B. Olds
Conrad Taeuber, *Chairman*

NEWS

Conference on Business Statistics—Summer Conferences—The Mathematical Training of Social Scientists—Positions Available—New Publications

Conference on Business Statistics

Sponsored by The American Statistical Association and The Wharton School

The American Statistical Association Section on Business and Economic Statistics and the University of Pennsylvania, Wharton School, sponsored a two-day conference on June 12 and 13 at Houston Hall on the campus of the University of Pennsylvania. The meeting was planned by a committee under the chairmanship of Benedict Saurino.

The primary aim of the conference was to bring businessmen and technicians together to discuss the problems faced by corporate management, the tools used in the solutions of these problems, and a discussion of the case histories which were presented at the meetings by representatives of business and of the Wharton School.

There were a number of luncheon and dinner meetings in connection with the conference, and the heads of the two sponsoring institutions, Aryness Joy Wickens, President of the ASA, and Dean Canby Balderston of the Wharton School, gave the keynote speeches.

The conferences were divided into the three following general fields:

Production

Moderator – Dr. R. T. Bowman
with Dr. A. G. Abramson and
Dr. W. W. Cooper

1) Use of statistics to improve production scheduling and control.
2) Intra-company measures of production performance.
3) Wages and productivity.

Distribution

Moderator – Dr. Reavis Cox
with Mr. Wroe Alderson and
Dr. Walter Hoadley

1) Forecasting.
2) Measurement of sales performance.
3) Techniques for price determination.

Finance

Moderators—Dr. R. Whittlesey and Dr. R. Wixon with Mr. R. S. McNamara, V. P., General Motors Corp. and Mr. C. O. Wellington, Scovile Wellington Co.

1) Capital budgeting.
2) Measuring real corporate income under inflation.
3) Effect of price instability on break-even levels.

Further details concerning proceedings of the conferences may be obtained from the Chairman of a special committee for the Conference on Business Statistics, J. Hunter McDowell, Sun Oil Company, 1600 Walnut Street, Philadelphia 3, Pennsylvania.

Statistical Summer Session, Virginia Polytechnic Institute, July 29 to August 15, 1952

The Department of Statistics and the Statistical Laboratory in cooperation with the Department of Mathematics and the Department of Industrial Engineering of the Virginia Polytechnic Institute will conduct a special statistical summer session, July 29 to August 15, 1952. The program will be for graduate students, research workers, and technicians in government and industry. Special offerings will be given in the statistics of taste testing, bio-assay, sampling and in engineering research and production. For further details write the Department of Statistics, Virginia Polytechnic Institute, Blacksburg, Virginia.

Connor and Savage to Edit Questions and Answers Department

The Editors of The American Statistician are pleased to announce that W. S. Connor, Jr., and I. R. Savage of the Statistical Engineering Laboratory of the National Bureau of Standards have agreed to serve as Joint Editors of the Questions and Answers Department. The feature will appear again in each issue beginning with June-July 1952. Frederick Mosteller, who edited the Questions and Answers Department of The American Statistician since 1947, has found it necessary to resign from the Editorship because of the pressure of other work for the Association.

Anyone wishing to submit a question should write directly to the Editors at the Statistical Engineering Laboratory, National Bureau of Standards, Washington 25, D. C.

Institute of Statistics Summer Conference

The Institute of Statistics, The Consolidated University of North Carolina with financial assistance from foundation funds is conducting an integrated series of summer conferences, June 16th - July 25th, 1952. These conferences are for consulting statisticians and research workers who are using statistics. The advisory services of R. A. Fisher and Frank Yates have been secured for the entire period. W. G. Cochran will serve in the same capacity from July 7 - July 25.

The general plan is to have one or two papers presented each morning. Mimeographed copies of most papers will be provided for the conferees. The afternoons will be free for recreation or small group discussions. Each evening the conference group will meet for further discussions.

The program follows:

June 16 to June 20: Pasture research methods. Types of problems and units of measure in grazing trials by G. O. Mott. Pasture research methods. Design, conduct and analysis of grazing trials by H. L. Lucas. Sequential experimentation by R. A. Fisher. Long time rotation experiments by Frank Yates. Perennial experiments with special emphasis on tree crops by H. Fairfield Smith.

June 23 to June 27: Estimation of linkage relations by R. A. Fisher. Selection indexes and discriminant functions by J. E. Legates. Estimation of variance and covariance components by C. R. Henderson. Gene interaction by T. W. Horner. Rank analysis for incomplete block designs with application to sensory testing by R. A. Bradley and M. E. Terry. Multivariate analysis by Harold Hotelling.

June 30 to July 4: Experimental designs in engineering: A textile example by F. R. Del Priore. Experimental designs in engineering: A fractional replication in bearing research by F. R. Del Priore. Problems in fatigue testing by J. T. Ransom. Determining transition temperature of alloys by R. W. Vanderbeck. Life testing of electronic tubes by Alfred Davies and J. R. Steen. Operations Analysis by LeRoy A. Brothers. Bombing accuracy analysis, Eighth Air Force, World War II by James A. Clarkson. Operations analysis of problems connected with the development and quality control of high tensile steel by Charles M. Mottley.

July 7 to July 11: Variance components by J. M. Cameron. Chemical applications of variance components by H. D. Wagner. Fitting linear trends by Forman Acton. Information and communication theory by Brook McMillan. Statistical applications of martingales by James Snell.

July 14 to July 18: Analysis of percentage data in complex designs by S. Lee Crump. Analysis of percentage data in complex designs by J. W. Tukey. A sequential method for clinical experiments by Irwin D. Bross. The construction of controls for comparison with a known specific group by Harold V. Dorn. Ex post facto experiments by F. Stuart Chapin. The Indianapolis fertility studies — an example of planned observational research by Clyde V. Kiser. Analysis of sociometric data by Paul Minton. Analysis of sociometric data by Leo Katz. Problems of scaling social science data.

July 21 to July 25: Distinction between analytic and enumerative uses of data and its effect on design and analysis by W. E. Deming. Biased versus unbiased estimates by W. G. Cochran. Area sampling by R. J. Jessen and others. Organization of statistics in a university by A. H. Bowker. Course content, curricula and degree requirements in statistics. The statistician as a consultant to university research workers by Carl F. Kossack. Statistical research programs and outside contracts.

These conferences are to be held at Blue Ridge Assembly which is fifteen miles east of Asheville and three miles from Black Mountain, North Carolina. Recreation facilities include swimming, tennis, playgrounds, golf course, horseback riding and hiking in the Blue Ridge mountains. The Blue Ridge Assembly grounds have their own three peaks, 4,500 feet elevation and the buildings stand at 2,700 feet.

Attendance at these conferences for statisticians is to be limited to enable an opportunity for each person to take part in the program and discussion. Facilities for families can be arranged.

Two weeks will be the maximum time a statistician can stay. For information write Miss Gertrude Cox, Box 5457, State College Station, Raleigh, North Carolina.

Wald Memorial Fund

As a tribute in memory of the late Professor Abraham Wald, who was killed with Mrs. Wald in an airplane accident in India December 13, 1950, a group of friends and colleagues are establishing a fund to help in defraying the expenses of a college education for his two children — Betty, eight years old, and Bobby, now four.

Trustees of the fund are Theodore W. Anderson, Howard Levene, and Mortimer Spiegelman. Contributions may be made payable to WALD MEMORIAL FUND and may be sent to Howard Levene, Box 23 Fayerweather, Columbia University, New York 27, New York.

The American Society for Testing Materials' Fiftieth Anniversary

The Fiftieth Anniversary of the American Society for Testing Materials will be celebrated in New York during the week of June 23. Further details may be obtained from the Society headquarters, 1916 Race Street, Philadelphia 3, Pennsylvania.

Name of the Division of Statistical Standards Changed

As a result of the reorganization within the Bureau of the Budget in April, the Division of Statistical Standards — which serves as the central coordinating agency for Government statistical activities — became the Office of Statistical Standards, with no change in functions.

Preparation of Problem and Source Materials for the Mathematical Training of Social Scientists

As readers of this publication probably know, a Committee on the Mathematical Training of Social Scientists has been at work for some time. The Committee includes representatives from the following associations and societies: American Anthropological Association, American Economic Association, American Educational Research Association, American Farm Economic Association, American Political Science Association, American Psychological Association, American Sociological Society, American Statistical Association, Econometric Society, Institute of Mathematical Statistics, Mathematical Association of America, and Psychometric Society.

As the result of a suggestion from this Committee, the Social Science Research Council is now sponsoring a small group to work during the summer of 1952. This group will attempt to compile from the literature of the various social sciences lists of problems, extracts from sources, and references to sources that illustrate varieties of uses of mathematics in the social sciences. These compilations are expected to serve a number of important ends – e.g., to provide mathematicians with material for use in texts and courses designed for social scientists, to indicate the general dimensions of the mathematical training appropriate for students of the social sciences now and in the future, and to facilitate the study of mathematics by social scientists for whom organized courses are not available.

This Committee believes that the group referred to would find it most helpful if it could start with a wide variety of suggestions from the various areas concerned. A general appeal for such suggestions is hereby made. They should be sent to Professor William G. Madow, Chairman, Committee on the Mathematical Training of Social Scientists, University of Illinois, Urbana, Illinois as soon as possible.

Although the Committee does not wish to limit the suggestions to specific types of material, it would prefer greater emphasis on materials relating to the use of mathematics in the social sciences themselves than on those relating to statistics, since the materials necessary for statistics are better known. Moreover, the Committee would suggest that those who respond not concern themselves with questions of duplication of what others would say, but give as much information as possible. This first request for assistance is aimed at providing those who are interested in this subject with an opportunity to make their views known to the Committee in as general terms as they wish.

Finally, the Committee would appreciate learning where programs of mathematical training intended for social scientists are now in existence or in process of development, and where mathematics at the level of the calculus or higher is required for undergraduate or graduate degrees in the social sciences or may be substituted for another requirement for a degree in a social science.

The Navy Needs Statisticians in Washington

The Navy Department informs us that it has a recurring need for Analytical Statisticians. These positions, ranging from grade GS 7 ($4,205) to GS 12 ($7,040), are located in Washington, D. C. Present vacancies vary, in required experience, from medical statistics to the aircraft logistics and supply requirements fields; some require supervisory experience. Generally, civil service status, or eligibility on the civil service register for Statisticians is required; however, some positions may be excepted from this requirement. Applications, or requests for further information, should be addressed to The Head, Employment Branch, Room 1003, DCPD, Department of the Navy, Washington 25, D. C.

New Journal on Applied Statistics

The Royal Statistical Society has announced publication of a new periodical, *Applied Statistics*, to be edited for the Society by L. H. C. Tippett. The Journal is intended to appeal to professional and non-professional workers interested in the applications of statistical method. The purpose of the new journal is to publish articles of sufficient scope and variety to interest administrators and executive officers, technologists and engineers, physicists and chemists, biologists and agricultural scientists, psychologists and medical scientiests, economists and social scientists, teachers and students. The articles are to be non-technical in language and will include book reviews, correspondence and answers to questions and problems submitted by readers. The activities of the Industrial Applications Section and the Study Section of the Royal Statistical Society will also be represented in the Journal.

Applied Statistics will be issued three times a year, in March, June, and November. Annual subscriptions will be available to the public at $4.00 a year and should be sent to the publishers, Oliver and Boyd Ltd., Tweeddale Court, Edinburgh 1, Scotland.

Pakistan Statistical Association Holds Second Conference

The recently organized Pakistan Statistical Association held its Second Annual Meeting on January 25 and 26 of 1952 at Dacca. A number of technical papers were read and delegates visited the Statistical Laboratory, the Machine Center of the Census Office, and the various statistical offices of the Pakistan Government. Present membership of the Association is approximately twenty-five, including the outstanding statisticians of government, education and business in Pakistan.

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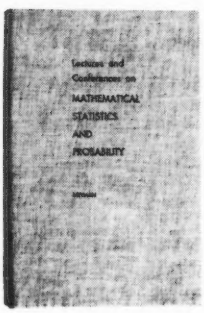

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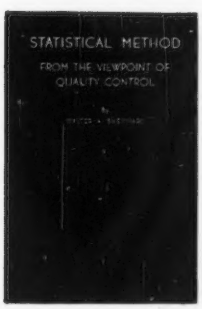

GRADUATE SCHOOL **U. S. Department of Agriculture** **Washington 25, D. C.**

Federal Statistical Activities

Plans for Adoption of New Base Period for Index Numbers

A number of Federal agencies have revised or are planning to revise their index numbers in accordance with the recommendation made last summer that the base period for indexes be shifted from prewar periods to the postwar years 1947-49. This recommendation was made by the Division of Statistical Standards, Bureau of the Budget, after consultation with producers and users of index numbers, both within and outside the Federal Government (*The American Statistician*, October 1951, p. 18).

The following statements summarize the plans of the Board of Governors of the Federal Reserve System, the Bureau of Labor Statistics, and the Bureau of Agricultural Economics for shifting the base period of their indexes to the recommended new postwar period.

Board of Governors of the Federal Reserve System

The Federal Reserve Board is now publishing several indexes on a 1947-49 base, and plans to convert all other series published in relative form to this base during 1952. The approximate dates on which the shift will be accomplished for individual series are as follows:

Monthly index of output of major consumer durable goods—This new series, first published in the October 1951 issue of the Federal Reserve Bulletin, is compiled on the 1947-49 base.

Department store sales and stocks—The base period for the monthly indexes of sales and stocks was changed from 1935-39 to 1947-49 as part of the general revision of these indexes, and published in the December 1951 issue of the Bulletin. A revision of the weekly indexes of department store sales, including the base period change, is scheduled for completion by the end of April. For the monthly indexes of sales and stocks by major departments, the new base period probably will not be adopted before the end of 1952.

Monthly index of industrial production—The base period will be changed from 1935-39 to 1947-49 as part of the comprehensive revision of this index now in process, scheduled for completion in mid-1952.

Other series—The 1947-49 base period has been adopted for all other series (except freight carloadings) originated by the Federal Reserve System and published in relative form in the Bulletin or in mimeographed releases. These include indexes of construction contracts awarded (based on F. W. Dodge Corporation data), several indexes relating to consumer credit, and several indexes relating to seasonally adjusted employment (based on Bureau of Labor Statistics unadjusted data). The index of freight carloadings will be put on the new base later in 1952.

ARTHUR L. BROIDA,
Division of Research and Statistics, Board of Governors of the Federal Reserve System

Bureau of Labor Statistics

Plans are under way to change the base period for most indexes published by the Bureau of Labor Statistics to a 1947-49 base period during calendar year 1952. The following summary shows the approximate dates for the shift to the new base.

Prices—The comprehensive revision of the Wholesale Price Index, including a shift to the new base period, became effective with the release for January 1952. The Consumers' Price Index is now undergoing a comprehensive revision, which will include a shift to the 1947-49 base period. This revision is expected to become effective with the release for January 1953.

Employment and payrolls—The following indexes included in the Employment and Payrolls Detailed Report were revised from a 1939 base to the 1947-49 base beginning with the January 1952 report:

Production-worker employment index, all manufacturing
Production-worker payroll index, all manufacturing

Hours and earnings—The following indexes and series published on a 1939 base in the Hours and Earnings Industry Report use the Consumers' Price Index, and therefore cannot be changed to the new base until revision of the CPI is completed:

Gross average weekly earnings of production workers in selected industries, in 1939 dollars
Index of average weekly earnings, all manufacturing
Net spendable average weekly earnings in 1939 dollars, all manufacturing
Index of average hourly earnings excluding overtime, all manufacturing

Indexes of union wage scales—These indexes will be placed on the 1947-49 base with the publication of annual surveys for 1951.

Salary and wage indexes derived from secondary sources—The exact date of publication for the following indexes is not known, but previously published series will be changed to a new postwar base, as indicated, in presenting data for 1951:

Indexes of salaries of policemen and firemen—to be converted to the 1947-49 base period
Indexes of salaries of public school teachers—to be converted to a 1947 and 1949 base period (data for 1948 unavailable)
Indexes of salaries of Federal classified workers—to be converted to the 1947-49 base period
Index of salaries of office clerical workers in selected cities (not previously published)—to be presented on a 1950 base, since data in some cities are unavailable for at least one of the years 1947, 1948 or 1949
Index of occupational wage rates in machinery manufacturing (not previously published)—to be presented on the 1947-49 base period

Unit man-hour indexes—Plans are now under discussion for shifting the base period of the general productivity indexes and the indexes based on direct reports from manufacturers to the new postwar base.

Indexes of the valuation of urban building authorized, by class of construction, 1929—These indexes, formerly based on the monthly average for 1935-39, were changed to the 1947-49 base period with the release of data for January 1952.

Industrial injuries—Plans are still in the discussion stage for shifting the Index of Injury Frequency Rates in Manufacturing by Extent of Disability from its present base period of 1926 to a new postwar base of 1949.

SAMUEL WEISS,
Office of Statistical Standards, Bureau of Labor Statistics, Department of Labor

Bureau of Agricultural Economics

The two principal price indexes which the Bureau of Agricultural Economics computes currently are the Index of Prices Received by Farmers and the Parity Index (Prices Paid by Farmers). The reference base for these indexes is fixed by legislation, so for the time being BAE must continue to use the 1910-14 average as the base period. Consideration could, however, be given to shifting the weighting patterns for these indexes from the current weighting base, 1937-41, to 1947-49. BAE recognizes the desirability of utilizing recent weights in these indexes, but data on farmers' expenditures for living and production purposes are not available in sufficient detail for recalculating or shifting the weight base to 1947-49 or any other postwar period. The Bureau expects to bring the weighting pattern up to date when resources become available for making the necessary surveys.

For the Indexes of Prices Received and Prices Paid by Farmers, BAE has followed the practice of publishing both 1910-14 and 1935-39 average commodity prices and indexes for comparative purposes. Since the base period to be used in Federal indexes is generally being shifted to 1947-49, BAE plans to publish average prices and indexes for this

period for comparative purposes in place of the averages now carried for 1935-39.

With regard to its various other indexes, such as the indexes of farm output and average per capita food consumption, BAE is reviewing the situation with a view toward seeing which indexes can be shifted to a 1947-49 base, considering problems that would be raised because of the relationships between the various indexes, and examining the question of how soon such revisions can be accomplished in view of the workload involved.

O. V. WELLS,
Chief, Bureau of Agricultural Economics, Department of Agriculture

Revision of the Wholesale Price Index

The Bureau of Labor Statistics late in February issued the revised Wholesale Price Index for the month of January 1952. Along with the initial release, historical data were given for groups, subgroups and product classes of the revised index for the period from January 1947 forward, and the indexes for "all commodities" and "all commodities other than farm and food" by months from January 1926 forward.

The revised index is on the recommended postwar base period 1947-49. The weights for the index represent all sales at the primary market level during the calendar year 1947. The classification scheme has been expanded from 10 major groups to 15 major groups, 88 subgroups and approximately 250 product classes. The revised index contains approximately 2,000 commodities in place of the 900 commodities previously included. The Bureau of Labor Statistics has available, and will supply upon request, detailed specifications for each commodity and historical indexes or prices for each individual commodity for the period since January 1947.

A complete "Description of the Revised Wholesale Price Index" appeared as a technical note in the *Monthly Labor Review* for February 1952 and has been reprinted as Serial R-2067. This reprint is available from the Superintendent of Documents, Government Printing Office, for 5 cents.

The weekly wholesale price index has been revised to the same base and weighting period as the monthly index. The weekly index is based upon a sample of approximately 200 commodities and computed as an estimated percent change from the preceding monthly index, but is published as an estimated index. As the monthly index becomes available, all weekly indexes for that month are cancelled, and no continuous weekly series are published. Weekly group indexes are prepared for all commodities, farm products, foods, and all other commodities.

EDWARD HOLLANDER,
Chief, Division of Prices and Cost of Living, Bureau of Labor Statistics, Department of Labor

Reorganization of Technical and Statistical Publications of the Public Health Service

The Public Health Service of the Federal Security Agency has reorganized its technical and statistical publications along broad functional lines, replacing heterogeneous and miscellaneous nonperiodical releases by a limited number of defined releases.

In the field of technical periodicals, a new monthly publication, *Public Health Reports*, the first issue of which appeared in January 1952, has replaced three major journals dealing with scientific and technical material in relatively narrow specialized areas—the old weekly Public Health Reports with its monthly Tuberculosis Control Issue, the Journal of Venereal Disease Information, and the Communicable Disease Center Bulletin.

In the field of statistical periodicals, the National Office of Vital Statistics began publication in January of a new *Morbidity and Mortality Weekly Report*, which combines in one publication domestic morbidity data previously published in the weekly Public Health Reports and the Weekly Morbidity Report, and certain data from the former Weekly Mortality Index. The new consolidated weekly report also includes a tabulation of the provisional numbers of cases reported by States during the week for 25 communicable diseases, and for a smaller group of diseases reported by cities.

The National Office of Vital Statistics also began publication in March of a new *Monthly Vital Statistics Report*, replacing the former Monthly Marriage Report, Monthly Vital Statistics Bulletin, and Current Mortality Analysis. The new publication presents monthly and cumulative data, starting with January 1952, on births, marriage licenses, deaths and infant deaths for States, certain cities, and Hawaii, and on marriage licenses for major cities, with a brief analysis of these data. It also presents death rates by cause, age, race and sex, estimated from the returns of a 10 percent sample of death certificates filed in State and independent city vital statistics offices.

Subscriptions to *Public Health Reports*, at $4.25 a year, may be made through the Superintendent of Documents, Government Printing Office, Washington 25, D. C. Requests for copies or addition to the mailing list for the *Morbidity and Mortality Weekly Report* or the *Monthly Vital Statistics Report* should be made to the National Office of Vital Statistics, Public Health Service, Washington 25, D. C.

HOWARD ENNES,
Executive Editor, *Public Health Reports*, Public Health Service, Federal Security Agency

Catalog of Census Publications And Monthly Supplement

The Bureau of the Census is issuing a quarterly *Catalog of United States Census Publications* cumulative to an annual issue and a *Monthly Supplement*, effective with the 1952 publication program. This Catalog and Supplement were formerly issued, with the same frequency, under the titles "Census Publications Catalog and Subject Guide" and "List of Publications Issued."

As in the past, the issues of the Catalog will cover the entire publication program of the Census Bureau, and the Supplement will list reports, except those of a regular monthly or quarterly nature, issued during a given month. The latter category includes the reports of the major censuses; annual reports in regular series and all other reports issued annually; and one-time reports. The Supplement will also provide information on changes in regular series, and will list the initial report in a new series and the final report in a discontinued series.

The subscription rate for four consecutive issues of the Catalog, together with 12 monthly issues of the Supplement, is $1.50. The two publications are available from the Superintendent of Documents, Government Printing Office, Washington 25, D. C.

MORRIS B. ULLMAN,
Chief, Statistical Reports Section, Bureau of the Census, Department of Commerce

"Status of Program of 1950 Census of the Americas"

A revised report showing the status and results of census projects under the 1950 Census of the Americas program, as of December 1951, has been issued by the Inter American Statistical Institute (IASI release 1125a). Two tables are included, one showing total population and annual geometric rate of growth, according to censuses under the 1950 program and previous censuses; and the other showing the population of national capitals for all countries of the Western Hemisphere which have completed enumerations. An appendix lists sources of the data given, including citations to national publications containing census results where these have been published.

This release is brought up to date and reissued periodically. Copies of the reports on "Status of Program of 1950 Census of the Americas" are available on request from the Inter American Statistical Institute, c/o Pan American Union, Washington 6, D. C.

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Z16 Accidents Statistics Committee

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Holbrook Working

MORE NEWS

Examination for Government Statistician Open

The U. S. Civil Service Commission at Washington, D. C., has announced an examination for filling statistical positions in the Federal service in Washington and vicinity. These positions pay from $7,000 to $10,800 a year.

Candidates for this examination must have had responsible professional experience of a very high order in statistical research pertaining to one or more specialized fields such as economics, agricultural economics, sociology, social service administration, public administration, public health, agriculture, biology, forestry, education, psychology, physical science, mathematical statistics, mathematics, or engineering. They are not required to take a written examination. Details about all the requirements are given in the examination announcement.

Information and application forms may be obtained at most first and second-class post offices, from Civil Service regional offices, or from the U. S. Civil Service Commission, Washington 25, D. C. Applications should be sent to the Executive Secretary, Board of U. S. Civil Service Examiners, Bureau of the Census, Washington 25, D. C. They will be accepted until further notice.

Letter to the Editor

The American Statistician seems to be a good medium for possible interchange of information between Governmental agencies interested in classification of industrial enterprises, non-governmental coders of information and users of classified industrial statistics. At present, manufacturing activity is classified by Federal agencies in accordance with the *Standard Industrial Classification Manual* published by the Bureau of the Budget in 1945, and since supplemented by a similar classification of non-manufacturing activity issued by the Bureau of the Budget in May 1949. Coding and interpretative problems, which arise from technological changes and the development of new activities, not specifically covered by Budget Bureau codes, are being dealt with systematically through inter-agency clearance and exchange of information along Federal-State lines. There seems to be no formal medium of opinion exchange between governmental and non-governmental classifiers of industrial activity (except at specific sessions in the annual meeting program).

It occurs to me that the *American Statistician* might publish proposals for temporary classifications for activities, brought to light through inquiries both private and governmental, not covered by existing codes. In this way such proposed classifications could be brought to the attention of the Bureau of the Budget. In the present scheme of things, the expense involved in the issuance of completely revised Manuals prohibits frequent issuance of revised classification codes. Meanwhile the classification of new and unusual activities becomes the subject of "fitting" by individual interpretation; in some instances, this causes confusion in statistical interpretation. Issuance and publication of accepted temporary new classifications, for use during a "frozen" period of a dated code, would not only prevent

Report to the Directors of the American Statistical Association on the Organization and Work of the Advisory Committee on Statistical Policy to the Division of Statistical Standards Bureau of the Budget

At the Annual Meeting of the Directors of the American Statistical Association in December 1950 the appointment of an Advisory Committee on Statistical Policy to the Division of Statistical Standards, Bureau of the Budget, was authorized. This action was taken in response to a request from the Division of Statistical Standards and with the full concurrence of the Division. In making its request the Division pointed out that in exercising its statutory responsibilities for the coordination of Federal statistical activities it frequently encounters fundamental issues of policy that affect not only the statistical services of the Government but the interests of the statistical profession and of the users of statistics throughout the country as well. Because of the broad importance of these policy questions the Division is of the opinion that the Association can be of assistance in aiding it to meet its responsibilities.

The function of the Advisory Committee is to consider broad policy issues and questions concerning the statistical programs of the Federal Government and to advise the Division of Statistical Standards thereon. The Committee works from an agenda of items proposed by the Division and by members of the Committee, with the Committee retaining the right to revise or delete any item that may be proposed. The Committee does not act as a technical committee to review individual forms, schedules, or procedures. Where such detailed technical review is desired it is understood that it will be provided through other committees set up by the Association to advise on a particular subject, or subjects, or to advise a particular agency, as provided in the report of the (Association's) Committee on Committees in 1949.

Present members of the Advisory Committee are E. A. Goldenweiser, Chairman, Simon Kuznets, Isador Lubin, Frederick C. Mills, William F. Ogburn, Lowell J. Reed, and Samuel S. Wilks. William J. Carson of the National Bureau of Economic Research and the University of Pennsylvania is Secretary and Stanley Lebergott of the Division of Statistical Standards is Assistant Secretary to the Committee.

The plan of organization provides that members of the Committee shall each be appointed for a term of three years with the usual rotation as recommended by the Committee on Committees in 1949, except that the initial appointments of the Advisory Committee shall be made in such manner as to provide that one-third shall retire at the end of the first year, one-third at the end of the second year, and one-third at the end of the third year. It provides also that the Committee shall include from six to nine members appointed by the President of the Association from a panel of Past Presidents, the President, and President-elect of the Association, and in such a way as to assure a balance between various groups in the Association having special interests in government statistics.

The first meeting of the Committee, held on October 9, 1951 was devoted primarily to discussion of problems which arise from the confidential status accorded by Federal agencies to individual returns. One of the recommendations of the Hoover Commission task force on statistical agencies was that the Division of Statistical Standards, with the collaboration of interested Federal agencies and with participation of experts from outside the government, undertake a study: "To determine to what degree provisions concerning the confidential character of certain reports to Federal agencies make for duplication of activities and for heavier burdens on respondents; to explore means by which such information can be placed at the disposal of other Federal agencies under rules affording proper protection to individual respondents."

The Committee had for its consideration a memorandum on "Confidentiality and the Development of Federal Statistical Policy" prepared by the Division of Statistical Standards. Various aspects of the problem were discussed by representatives of statistical agencies particularly concerned: Bureau of Agricultural Economics, Bureau of the Census, Bureau of Labor Statistics, Federal Trade Commission, and Office of Price Stabilization. Before submitting its recommendations for consideration by the Division of Statistical Standards, the committee plans further investigation into the problems of confidential status of individual returns as it affects the collection and use of data by Federal agencies.

Other issues which the Committee will investigate at later meetings include the use of mandatory provisions by Federal statistical agencies for collecting statistical reports, and the problems involved in statistical and related research conducted for Federal agencies by non-governmental organizations.

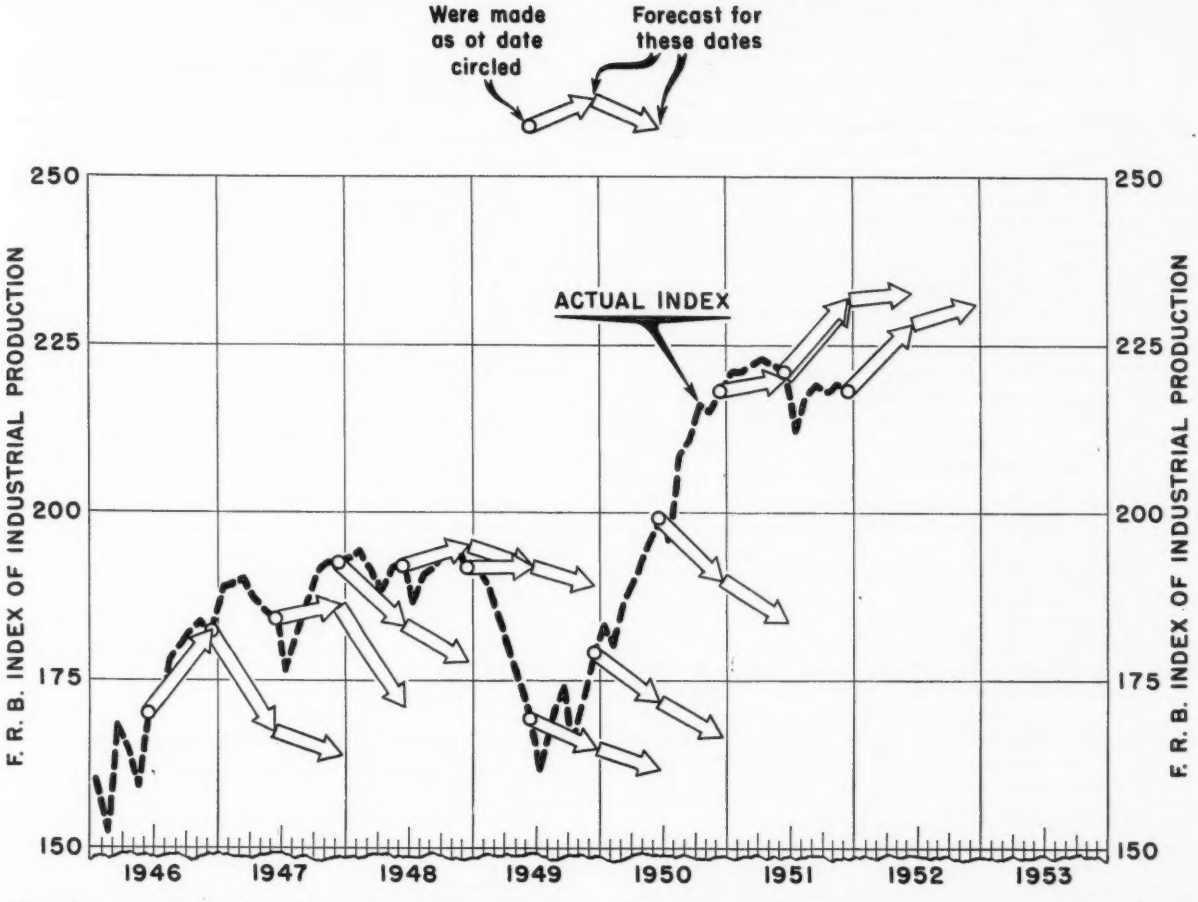
MORE NEWS

confusion but would add to the value of published statistics; the users of industrial statistics would then have more confidence in the meaning of classified aggregates.

This seems to be an area wherein the American Statistical Association might contribute a valuable technical service involving both governmental and non-governmental classification clearance. *The American Statistician* should invite exchange of opinion between coders and the users of coded data; perhaps this will stimulate correspondence and discussion on this matter to provide a basis for inclusion in the annual meeting of a session devoted to this subject.

William Netschert
One Wayside Lane, Lawrence Township
Trenton, New Jersey

AVERAGE OF FORECASTS OF INDUSTRIAL PRODUCTION INDEX MADE BY LEADING ECONOMISTS FOR J. A. LIVINGSTON



The chart compares six and twelve-month forecasts of Industrial Production with the actual trend. A breakdown of the forecasts by economist's affiliation, e. g., Business, Investment, Government, or Trade Union, showed no significant difference in foresight between the groups.

Many economic statistics are collected and analyzed primarily in the hope of forecasting business fluctuations. Starting with ten participants in 1946, about fifty economists now make definite numerical predictions for J. A. Livingston, whose column appears in the "Philadelphia Bulletin" and many other newspapers.

MORE NEWS

Special Session on Survey Sampling

The Statistical Laboratory of Iowa State College designated the first six weeks of the spring quarter, beginning March 27, 1952, as a special session in survey sampling. In addition to the series of daily lectures in intermediate and advanced survey sampling given by Dr. P. V. Sukhatme, Visiting Professor of Statistics, a number of other special talks were scheduled which included the following: on April 16 and 17, "Sampling in two related populations" and "Consumer acceptance and preference in retail store experiments" by Glenn L. Burrows, Mathematical Statistician in the Bureau of Agricultural Economics, USDA; on April 30 "On measurement of response errors" by Morris Hansen, Assistant Director for Statistical Standards, Bureau of the Census; on May 1, "Sampling with variable probabilities" by William Hurwitz, Chief, Statistical Research Section of the Bureau of the Census; also on May 1 a discussion of "Application of statistical methods in the 1950 Censuses" by Hansen and Hurwitz.

The International Statistical Institute

The International Statistical Institute held its 27th Session for the first time in India in New Delhi from the 5th to the 11th December, 1951, with a short session in Calcutta from the 16th to the 18th December, 1951. The International Biometric Society, the International Econometrica Society, the International Association for Research in Income and Wealth, the International Union for the Scientific Study of Population, which are affiliated organizations, also held joint or associated meetings with the Institute. A special session was also convened of the Internationl Statistical Association for Asia and the Far East. All these meetings combined together were called the International Statistical Conferences: India 1951. The Indian Statistical Institute, Calcutta acted as the host society.

Nearly 150 distinguished statisticians from 40 countries, other than India, participated in the Conferences. Participants also included the representatives of UN, FAO, WHO, ECAFE, UNESCO, ILQ, ISO, and WMO.

Dr. Rajendra Prasad, President of the Republic of India, inaugurated the Conferences. Shri C. D. Deshmukh in his capacity as the Finance Minister, Chairman of the Executive Committee and President of the Indian Statistical Institute gave a review of the progress of statistics in India. After this the Prime Minister Shri Jawaharlal Nehru addressed the delegates, and remarked that he was glad to notice a tendency among statisticians to deal more and more with the human aspects of a problem. Dr. S. A. Rice, President of the International Statistical Institute then gave his address and very aptly termed the 27th session "the session of fulfilling." Professor P. C. Mahalanobis presided.

Several meetings were held in the form of "Round Table" discussions which centered on the development of national statistical systems relating to population, agriculture and labour problems in the participating countries. These were followed by discussions on the concept of national wealth and income, estimation of national production in under-developed countries and related statistical problems, biometry and statistical sampling. The accuracy of demographic data including the accuracy of censuses and the problem of quality in census data, problems of industrial statistics and statistical control of industrial products were also discussed.

Many excursions were arranged including an air trip to Jaiphur, and a special train brought the delegates from Delhi to Calcutta with three night and day halts at Agra and Benares. In the Indian Statistical Institute in Calcutta the delegates had the opportunity to study the working of the National Sample Survey Project of the Government of India. And a trip to Nahazari, a sample village near Calcutta, provided the visitors a first hand opportunity of seeing village maps and their uses, plot identification, acreage survey work, the development of the crop-cutting technique, distribution of sampled households, etc.

The Calcutta session of the Conferences was followed by statistical seminars from the 19th to the 22nd December, 1951; and lectures were delivered by eminent statisticians on population and vital statistics, labour statistics, national income and theoretical statistics; and also by the fifth session of the United Nations Sub-Commission on Statistical Sampling.

The United Nations Sub-Commission on Statistical Sampling held its fifth session in Calcutta from the 19th December, 1951 to the 2nd January, 1952. At the first meeting of the session, Professor P. C. Mahalanobis was elected Chairman for the fifth time. Many subjects of special interest were discussed in the session among which may be mentioned: the use of survey and experimental techniques for the development of agriculture and small-scale (household and cottage) industries especially in under-developed countries, sample surveys of current interest, use of sampling techniques for the improvement of statistics on acreage yield and forecast, statistical technique for the development of methods for testing standards for countries entering into international trade, statistical technique in industry as a national resource, sample surveys carried out by Indian Statistical Institute, sampling in population censuses, report on sampling to obtain road-statistics, sampling of administrative forms, etc.

15th International Congress of Sociology Istanbul, September 11-17, 1952

During the 14th Congress of the International Institute of Sociology that was held in Rome in September of 1950, it was unanimously decided to hold the next Congress in Istanbul in September 1952. The Universities of Istanbul and Ankara and the Ministries of National Education and Foreign Affairs are hosts to the Congress. The following subjects will be covered by papers to be presented: New Methods of Sociology, The Teaching of Sociology, Social Research Institutes, The Sociology of Primitive Populations, Social Phychology and the Psychology of Opinions, Social Groups and Sociography, Historical Sociology, Sociology of Technics, Rural Sociology, Emigration and Immigration, Cultural Transformations, Social Mobility and Stratification, The Problem of Refugees, The Sociology of Language, The Sociology of Law, Demography, Sociology and Mental Hygiene, Sociology of Folkways, The Sociological Study of Folklore, Sociology of Religion, Sociology of Knowledge, Economic Sociology, Sociolgy and Philsophy, The Sociology of Art, Problems of Habitation, and History of Sociology.

Full details concerning attendance and participation in the Conference may be obtained from the Secretary, N. S. Kosemihal, Edebiyat Fakultesi, Sosyoloji Enstitusu, Findikli-Istanbul.

NEWS about MEMBERS

B **Jack Justin Bard** is now Assistant to the President of the International Furniture Company, Chicago, Illinois.

Bishop Brown has been appointed Director of the Research Bureau for Marketing Training and Store Management of the University of Pittsburgh.

K. A. Brownlee has joined the Committee on Statistics at the University of Chicago as Assistant Professor. Mr. Brownlee will be working principally on the Committee's Statistical Research Center.

C **Kai Lai Chung, Jack Kiefer and Jacob Wolfowitz** have joined the staff of the Department of Mathematics of Cornell University.

Elizabeth Crawford is now working as an instructor in statistics and research at the School of Social Work of the University of Denver.

D **John E. Dobbin** has been appointed Director of the Cooperative Test Division of the Educational Testing Service at Princeton. Mr. Dobbin will supervise the activities of this division in the construction and distribution of psychological and achievement examinations for schools and colleges.

G **Amor Gosfield** has returned to the Department of Economics at the University of Pennsylvania where he is teaching and taking part in a project in dynamic inter-industry analysis for the Federal Government. Mr. Gosfield has just returned from two years in Puerto Rico where he directed an input-output analysis of the Puerto Rican economy.

Vernon R. Grom has left the Sylvania Electric Products Company, Inc., to accept a position in charge of the Statistical Quality Control Section and Gage Laboratory of the Metals Processing Division of Curtiss-Wright Corporation.

H **John F. Hoffman** has left his position as instructor and research associate in statistics at Iowa State College to work as a mathematical statistician in the Plans and Evaluation Section of Technical Operations at Dugway Proving Ground.

A. F. Holmes has accepted a position as Tax Specialist with the Royal Canadian Air Force. He will act as academic advisor to the Air Officer Commanding, Training Command, R.C.A.F., at Trenton, Ontario, on all matters pertaining to the use of tests in the training of air force personnel.

K **Mark Kac** is spending the year of 1951-52 on sabbatical leave at the Institute of Advanced Study, Princeton, New Jersey.

Kenneth H. Kramer received his Doctorate of Science in Mathematics from Carnegie Institute of Technology and is now employed by the Youngstown Sheet and Tube Company as a Development Engineer on the staff of the Director of Mill Research and Development. Mr. Kramer will be acting as a consultant on general statistical applications to quality control, production control and cost control.

L **Arthur Lenz** has left the New York City Department of Health to accept a position as Senior Statistician with the New York State Workmen's Compensation Board.

Clem C. Linnenberg, Jr., formerly in the Division of Statistical Standards, United States Bureau of the Budget, is now a Special Assistant in the Office of the Secretary of Commerce.

Donald B. Loveland is working as an Analytical Statistician with the Biometrics Section of the National Cancer Institute.

Ardie Lubin, formerly lecturer in statistical psychology at the Institute of Psychiatry at the University of London, is now a research psychologist with the Personnel Research Section of the Adjutant General's Office in the Department of the Army in Washington.

M **Garnet MacCreary,** formerly of the University of Winnipeg, is serving as statistical consultant for a project studying the incidence of mental disorders, this project being directed by Dr. Alexander Leighton.

Robert J. Myers, Chief Actuary of the Social Security Administration of the U. S. Government was elected to a 3-year term on the Board of Governors of the Society of Actuaries at its recent meeting in Toronto.

N **John D. Neff** is now a graduate teaching assistant in the Department of Mathematics at Purdue University where he has started studies leading to a Doctor's degree in mathematics.

O **James T. Oliver** has left his position as Senior Statistician for the Los Angeles County Health Department to assume the position of Principal Statistician for the City of Detroit Department of Health.

P **James A. Pierce** is now working with the Technical Design Section of Consolidated Vultee Aircraft Company. He is part of an armament group working on armament evaluation and vulnerability studies.

Charles F. Pinzka is now working as a Test Specialist in the Mathematics Section of the Educational Testing Service at Princeton.

E. Grosvenor Plowman has been awarded a Certificate of Appreciation, the highest award given by the Department of Defense for civilian service. Dr. Plowman resigned as special consultant of the Secretary of Defense on transportation and traffic management and adviser to the chairman of the Munitions Board on supply management. Dr. Plowman will return to his former posistion as vice president in charge of traffic for the United States Steel Company.

R **N. D. Rothwell** recently left the Housing Division of the Bureau of the Census and is now a consultant with National Analysts, Inc., in Philadelphia.

S **Howard L. Stier,** Professor of Agricultural Marketing and head of the State Departments at the University of Maryland, has joined the staff of the National Canners Association as Director of its Division of Statistics.

T **O. Tellez-Sarzola,** Chief Statistician of the Department of Biostatistics of the Peruvian Health Ministry has been invited by the Instituo de Planeamiento y Urbanismo of the Peruvian School of Engineering to give a series of lectures on demography and sanitary statistics.

W **Clarence M. Weiner,** formerly Senior Management Analyst of Survey Institute, Inc., New York City, has accepted an appointment as Assistant Director of the Research Department, United Auto Workers-CIO, in Detroit. Mr. Weiner was formerly Chief of the Special Studies Section of the U. S. Employment Service and the Veterans Administration.

Francis Joseph Weiss, formerly Special Research Consultant with the Sugar Research Foundation, Inc., has been appointed Scientific Consultant to the National Farmers Union. Dr. Weiss is a specialist in agricultural chemistry and the utilization of raw materials and commodities.

Statistical Activities of the United Nations

Introductory Remarks

by WILLIAM R. LEONARD, Director
Statistical Office of the United Nations

I intend to speak only very briefly at this point because I know you wish to proceed rapidly to a discussion of some of the problems with which we try to deal in international statistical work. It has been suggested, however, that a very brief background statement might be useful.

The Statistical Office of the United Nations is the central statistical secretariat for the United Nations organization. It is the Central Statistical Office at headquarters and establishes a general framework for the statistical work for the three regional economic commissions, which require certain detailed and specialized statistics for their direct purposes.

Broad policy questions about statistics are handled on an advisory basis by the Statistical Commission. The Commission is composed of the chief statisticians of 15 countries; it meets for two weeks each year. The Statistical Commission reports to the Economic and Social Council which, in turn, addresses resolutions on statistics to member governments and directs requests or instructions to the Secretary-General – the Secretariat. The Statistical Commission tends to be interested in the entire range of economic and social statistics. It is the successor organization of the Committee of Statistical Experts of the League of Nations, except that it has wider powers and a wider scope. Thus, some of the matters that come to the attention of the Statistical Commission fall within the operating functions of one or another of the specialized agencies. There are 8 or 10 of these agencies altogether operating in specialized fields such as agriculture, labour, health, finance, and so on. In these cases, the views of the Statistical Commission are addressed to the responsible agency either through the Economic and Social Council or through the Secretary-General, as appropriate.

Statistical functions are therefore divided between the United Nations and the specialized agencies in accordance with the substantive responsibilities of each agency. Thus, the Food and Agriculture Organization deals with agriculture statistics, the World Health Organization with health statistics, and the International Labour Office with labour statistics. The Statistical Office of the United Nations has responsibility for several comprehensive fields of statistics – these being associated with the other responsibilities of the United Nations. The Statistical Office is also a kind of residual agency for statistics not otherwise specifically allocated to one or another of the specialized agencies. The main subjects which the Statistical Office handles are population and vital statistics, production and prices, transport, foreign trade statistics, estimates of national income and social accounts, large segments of social statistics and statistical methods generally. The Office acts as a supplier of these basic statistics to other international agencies, many of which need them for their own purposes. Statistics of population, national income, production and trade, are necessary to facilitate the operating programmes of these agencies. Conversely, the other agencies supply to the United Nations such statistics as those on agriculture, labour, health, and finance. In certain cases, because of substantial mutual interest, the United Nations and a specialized agency collaborate in the collection or publication of certain statistics or in the development of statistical standards.

These few words of background should be supplemented by mentioning the main functions of the Statistical Office. I do this without elaboration, because they will be illustrated and explained in the speeches which follow. In addition to the central statistical functions which are exercised on behalf of the organization, the Statistical Office is responsible for the collection and publication of statistics covering as many countries as possible. It is responsible also for the development of statistical standards for the improvement of national statistics that is, for the formulation of concepts, definitions and methods.

The group of papers published here was prepared by the Statistical Office of the United Nations in cooperation with the New York Chapter of the American Statistical Association. The Albany, Connecticut and Central New Jersey Chapters of the Association joined in attending this special meeting of the New York Chapter, which was held in the new conference rooms of the United Nations on February 29, 1952.

International Aspects of Economic Statistics

By PATRICK J. LOFTUS

In the economic field the international statistician is confronted with a class of problems different from those of the national statistician. These problems arise largely from the fact that the international statistician is looking at world developments and seeking data which show the pattern of world economic change. The national aggregates are therefore components of the world aggregate. For example, in external trade the Statistical Office of United Nations seeks to measure the total flow of merchandise transactions from all countries. This total is analyzed in matrix form in which the cells give the values of the transactions between groups of countries — the groupings being made on the basis of economic characteristics. This matrix shows us the total value of world trade, the degree of imbalance in the total, the distribution of surpluses and deficits and the relation between the surpluses and deficits of the different groups of countries. Each group of countries is further analyzed by individual countries and the world matrix can, of course, be analyzed into a series of commodity matrices.

Although the international statistician begins with this macroscopic view of the world economy, the consumers of international statistics have such a variety of interests that he is compelled to set up a systematic method of presenting data which will meet a large number of different requirements of a detailed kind. To meet these varied needs the Statistical Office of United Nations has had to attempt to set up a system of international tables of economic statistics which, while presenting data on a world pattern, will also meet the most basic general needs for detailed data. The beginnings of this system have been laid in the Yearbooks, Bulletin and Statistical Papers, but the demand for statistics of this kind is almost insatiable.

Thus, because of our world-wide approach and because of the variety of needs of our customers, we find it necessary to present national data as components of series that have a much wider coverage. This involves us in problems of comparability and standardization which are only beginning to be solved.

In the standardization of economic statistics there may be conflicts between national and international requirements. To take the simplest of examples — U. N. requires to know, and make known, the size of the world's annual production of butter, but two of the biggest producers, Australia and New Zealand, lie in the Southern Hemisphere. To ask these countries to provide data about their butter production in a calendar year is therefore to ask them to close their books on 31 December when their production is at its peak. The same considerations apply to all variables which are affected by the incidence of winter and summer throughout the world. That which appears to the national statistician as seasonal fluctuation, appears to the international statistician as a difference in the distribution of production between the Northern and Southern Hemisphere.

In many ways, however, the natural obstacles to standardization are less serious than the man-made obstacles. Concepts of what is to be measured and units of measurement differ from country to country. The blessing of the decimal system has not yet been accepted by a number of important countries and the human wisdom and knowledge which created the metric system based on grammes and metres has not yet surmounted the Anglo-Saxon empiricism which created pounds and yards. In the publication "Commodity Trade Statistics" we have, wherever necessary and possible, converted national physical units to metric units. Value figures have been converted to current U. S. dollars. In deciding to use current U. S. dollars we departed from the methods of the League of Nations which summed up international trade in "old gold dollars." The old gold dollar aggregates had certain uses in measuring volume (or quantum) changes in international trade. It was felt, however, that current dollar aggregates were a more useful series and that volume changes were better expressed by means of index numbers. We therefore prepare aggregates of world exports and the national shares in these aggregates in current dollars. To measure the volume changes in world trade we take the national volume index-numbers and weight them according to the value of each country's share in world trade in the base year. For this purpose, national volume indexes are calculated by the Statistical Office for a number of countries which do not themselves make the calculations. We therefore have a quarterly and annual series of world and regional index numbers of the *volume* of exports; while the corresponding aggregates in current dollars constitute, in effect, a world regional series of index numbers of the value of exports. It is illustrative of the variety of requests we receive that we are compelled to derive from these two series a third series of world and regional export "prices." This kind of derived index-number brings up many of the unsolved problems that are so concisely summarized by Irving H. Siegel, in a note in the "American Statistician, December 1951," entitled "Some Problems for Index Number Workers."

In addition to the usual problems, however, we are faced with a problem of more serious dimensions because of the fact that we sum up the value data in U. S. dollars. The result of this is that the significance of the derived index of export prices cannot be described in logical terms, except possibly as an indicator of how world export prices would have moved if all international trade transactions were carried out in dollars. Now, the truth is, that a somewhat larger part of world trade is carried on in sterling than is carried on in dollars. The effect on this index of summing up in dollars was that it fell sharply after the devaluation of 1949, whereas it would have risen sharply if we had been summing up in sterling.

This is an illustration of the way in which the summarization of world price movements resists the

international approach. In the field of prices looked at internationally, the work of the Statistical Office has not yet progressed beyond the stage of collecting and publishing wholesale prices of basic commodities. Research has, however, been carried out on methods of compiling national wholesale price index-numbers and it is expected that the Statistical Commission will make recommendations on this subject at its next meeting. In one section of this field, administrative necessity has compelled the Statistical Office to undertake some hazardous experiments. Since the United Nations and its specialized agencies have staff stationed in many countries it has been necessary to devise means by which the emoluments for given grades of work should be internationally equivalent. Such an equivalence clearly is not achieved by the use of fixed exchange rates. The Statistical Office has therefore had to make a calculation of the relation existing between the cost-of-living of international officials in New York and that of their colleagues stationed in cities abroad. This has involved direct collection of expenditure data for these officials and direct price collections in cities abroad. For New York prices we have been greatly helped by the U. S. Bureau of Labor Statistics. Practically, a fair amount of work has been done in this field in response to administrative demands. The theoretical work has hardly begun, however, and the extent to which the international comparisons of value which are involved are supported by the theory of value itself, is somewhat in doubt.

Most of the problems which result from the international approach to statistics arise from really basic physical and institutional differences among countries. Where differences in statistical methods are not the result of fundamental differences of this kind, they are easier to reconcile and eliminate. A good example of statistical standardization can be found in the Statistical Office's work in measurement of industrial production. Most industrial countries compile index numbers of industrial production but the national series differ very considerably in scope, coverage, classification, formula, weighting, etc. In seeking to establish standard practices we have had to ensure that the standards recommended would represent progress in the case of even those countries whose methods were fairly advanced. At the same time, it was necessary that the standards should be formed in such a way that they would not be beyond the ultimate reach of the less advanced countries.

The compiling of world and regional statistics has certain compensations. As the data approach global coverage, a great many relations which do not exist at the national level become apparent. For example, there is no simple relation between the tonnage of goods loaded in international trade at the ports of a country and the corresponding tonnage unloaded. But with world coverage, loadings and unloadings must be approximately equal. In the same way world imports equal world exports and observed differences between the two aggregates consist of accountable differences in valuation, time, and freight and insurance. This fact enables the international statistician to produce statistics that are lacking at the national level. If we wish to calculate approximately the terms of trade of Cuba in 1951 as compared with 1948, we can do so without having any up-to-date statistics of Cuba itself. Given that Cuban exports go mainly to U.S.A., Germany, Netherlands and U. K.; and that her imports come mainly from U. S. A., Canada, Mexico, Spain, U. K. and India, we can reconstruct Cuban trade from the records of her partners.

The Use and Development of National Income Statistics

By J. B. D. DERKSEN

The United Nations work programme in national income statistics

National income statistics is a new field, and the conceptual and statistical problems involved are complicated. After the war a growing need was felt for exchange of information among governments, and for developmental work aimed at improving international comparability in this field and at providing assistance to governments wishing to organize national income units. In addition, national income statistics became indispensable for economic and finanical studies requested by the Economic and Social Council and other international agencies, and they are also used for certain operational and administrative purposes of the United Nations and other organizations. Consequently, national income statistics have figured prominently in the work programme of the Statistical Commission of the United Nations. Corresponding activities of the National Accounts Branch of the Statistical Office include the following:

(a) Collection, analysis and regular publication of national income statistics for as many countries as possible;

(b) Developmental work on standardization of concepts, terminology and classifications;

(c) Advice to governments, preparation of manuals, organization or participation in training centers and seminars, participation in fellowship programmes, preparation of national income projects under the Technical Assistance Programme of the United Nations.

(d) International comparisons of per capita income, distribution of income in under-developed countries, and other research projects.

Standardization Problems

National income is a comprehensive measure of the aggregate net output of goods and services in an economy. It is, therefore, an extremely complex concept. For this reason, and because of the many institutional

and structural factors involved, attempts to improve the international comparability of national income statistics must necessarily encounter serious difficulties. These problems remain comparatively simple as long as one limits oneself to general rules, for example that national income shall exclude the services of housewives, and the services of durable goods in the hands of consumers; that government general administration shall always be included, but not interest on the national debt; that public expenditure on buildings, roads and bridges, etc. shall be regarded as capital outlay, etc. In this respect considerable progress has been made in recent years in removing some of the major conceptual discrepancies among existing national income statistics.

Problems become more complicated, however, when attempts are made to establish uniform and detailed definitions of the sectors of the economy and money flows entering into aggregates of transactions.

As examples only the following are mentioned here: here:

(a) The systems and methods of financing social insurance differ from country to country. It is therefore difficult to develop comparable concepts of labour income.

(b) In some countries certain services in the field of communications are performed by private companies, usually paying a high indirect tax on the total gross receipts, whereas in other countries these services are performed by government enterprises, making large monopoly profits. To a certain extent the monopoly profits of government enterprises are comparable to the indirect taxes paid by private companies in other countries and should therefore be treated in the same way. But a precise solution is difficult to find and an element of arbitrariness is therefore difficult to avoid.

Other problems are inherent in our economic concepts. For example, it is customary in national income analysis to record transactions on an accrual basis, that is when services are being rendered, and not on a cash basis, that is when actual payments are made. In many cases, the conceptual problem may not be a difficult one, but the necessary adjustments of the statistical data may be difficult to apply. In other cases, a conceptual problem is involved, for example in the case of production requiring a long period of construction.

Another problem is the treatment of capital consumption allowances which must be deducted from gross output to arrive at net output figures.[1] In the first place there is the problem of developing objective criteria for determining wear and tear and economic and technical obsolence of existing equipment. Secondly, there is the problem of valuation. According to the definition of national income as generally adopted, capital consumption allowances should be valued at replacement prices and not at historical cost. Although in some cases available figures have been adjusted on a replacement cost basis, the procedure used must be considered as very tentative. Any attempt to formulate precise criteria applicable to all countries for defining and measuring capital consumption allowances on a comparable basis seems an almost hopeless task.

Of a different kind are the problems arising if concepts and classifications applicable to more industrialized countries are used for under-developed countries. For example, income from agriculture as it should be defined for under-developed countries is structurally very different from income from agriculture in the more developed countries. Not only is there the problem of defining and valuating the non-monetary output and consumption of the peasants, but the agricultural population in these countries performs many services (usually by primitive means) such as transportation and marketing of own products, spinning and weaving by the peasant and his family, repairs of tools and buildings, communal services, etc., which in more developed countries are carried out on a commercial basis by other business enterprises. It would be extremely difficult, if not impossible, to try to separate the subsidiary and miscellaneous activities of farmers in the under-developed countries from agriculture defined in a narrow sense. But these factors have to be taken into account in comparisons of the share of agriculture in the national income for developed and under-developed countries.

Place of National Income in an Integrated World Statistical System

At the national level development of national income statistics has often been found useful as a means for developing an integrated system of economic and financial statistics based on consistent definitions and uniform classifications and avoiding duplication of efforts.

For similar reasons it is desirable that the recommendations formulated by international agencies responsible for developing statistical standards be consistent and well integrated. The task of the reporting countries would be made unnecessarily difficult if for different purposes different concepts and classifications had to be used. The necessary coordination has been assured in certain important fields from the start.

The United Nations assists the governments through correspondence, reports and publications, and by the sending of experts. Furthermore, it may be expected that the *Handbook on Methods of Estimating National Income* now being prepared by the Statistical Office, and the Report on *Standard Concepts and Classification in National Accounting* that will be prepared this summer by a United Nations Committee of Experts, will be extremely useful to Governments wishing to organize national income research.

International Comparisons of National Income and Per Capita Income

The methodological and statistical problems involved in international comparisons of average per capita incomes are extremely complicated. The figures made available by the Statistical Office are necessarily

[1] In national income analysis we prefer the use of the term "capital consumption allowances" over "depreciation" which is used in the analysis of financial results of firms and may have a different meaning.

of a provisional nature, and were originally established for restricted use within the United Nations and certain of the specialized agencies.[2]

The results have often been discussed and much constructive criticism has been offered for improving the Statistical Office's work in this field.

In the first place the question has been raised how people in countries of South-East Asia could live on a per capita income of less than one-tenth or one-twentieth of the per capita income in the wealthiest countries. In addition to referring to the statistical problems involved in measuring and valuing output and consumption in the under-developed countries, two comments are usually made:

(a) Production in highly developed countries includes remuneration for transport, trading, legal, banking, insurance services, etc. for which there exists no, or certainly much less corresponding economic activity in the under-developed countries. This is reflected in price differences which should be taken into account;

(b) In the highly developed countries many items, such as bus and subway fares, and many kinds of personal services, enter into consumers' expenditure, which perhaps are more in the nature of an overhead cost of the economy, or which are largely rendered in the form of unpaid services in the peasants families or in the village communities in under-developed countries.

An attempt to take into account these factors would undoubtedly result in a considerable increase in the per capita income figures of under-developed countries as compared to highly developed countries.

[2] Cf. W. I. Abraham, "The Distribution of World Income," *The American Statistician*, Vol. 5, No. 2, April-May, 1951, p. 6.

Furthermore, per capita income figures of under-developed countries would be increased if the following factors were taken into account:

(a) Differences in the age distribution. In under-developed countries the percentage of children in the population is usually very large. The percentage of population aged 15 years and over is usually about 60 per cent, as compared to 70 per cent in the more developed countries. If this factor is taken into account the per capita income figure in under-developed countries would be raised by 10 to 20 per cent;

(b) Differences in the occupational structure. In the under-developed countries the percentage of the population in agriculture is usually much higher than in the more developed countries. But in nearly all countries average per capita income in agriculture tends to be considerably below that in manufacturing industry, trade and services. If the national income of under-developed countries is re-weighted according to the industrial breakdown in highly developed countries, the per capita income figure would go up by 20 to 60 per cent, and even more in some special cases.

Although it is certainly important that analysis along the lines indicated in previous paragraphs be continued, there can be little doubt that the study of international comparisons of per capita income would greatly benefit from direct investigations into the level of retail prices in various countries. However, no detailed decisions regarding the future work programme of the Statistical Office in this field have as yet been made.

Some Comments on "The Use and Development of National Income Statistics"

Dr. Derksen in describing the statistical activities of the National Accounts Branch of the UN Statistical Office has also indicated the many ways in which the users of national income estimates have become indebted to this organization. All users of income estimates should be grateful for the current annotated compilations of national accounts rearranged to conform, in their broader aspects at least, with standard conceptual definitions. This is no small achievement in view of the large number of estimates now available and the great heterogeneity in the economic, social and political conditions of the countries preparing the estimates.

However, my assignment, I take it, is not merely one of expressing a sense of gratitude on the part of the general consuming public. The invitation to discuss, I assume, carries with it the obligation to suggest possibilities for enlarging our debt to the Statistical Office. I should like therefor to present two possibilities. The first suggestion involves another technical, tedious job of straightening out the record. The Statistical Office has done yeoman service in ferreting out, clarifying, and compiling in usable form the various concepts that find their way into national accounts estimates. This process, in my opinion, should not stop at that level. An effort should be made to develop a compendium that describes in considerable detail the data and methods of estimate on which the national accounts of each of the reporting countries are based. The U. S. Department of Commerce has provided a splendid precedent in its recently published national income supplement. Other countries should be persuaded to provide a similarly comprehensive and candid description of their source materials and methods. The U. N. Statistical Office, I should think, could appropriately assume the arduous role of guiding and compiling such an international compendium or source book.

If the task were well done, it could be an important influence in raising the level of statistical ethics and

practice in this particular area and it could be a basis for improving the estimates themselves. Equally important would be its usefulness to analysts who rely on these estimates as their raw material. Obviously how much analytical weight can be carried by an estimate varies tremendously with the quality of the estimate: whether it is well grounded in data or is the product of the extrasensory perceptions of the estimator.

Let me illustrate this point by reference to the U. S. estimates and some work on which I happen to be currently engaged. In the course of investigating personal income during business cycles in the United States, I find it useful to determine the cyclical pattern of each type of personal income, including the rental income of persons. However the Department of Commerce informs us that "the final [rent] estimates are often calculated as the differences between much larger items which, in turn, are also obtained as residuals. Even small errors made at the various stages of the estimating procedure may significantly affect the final results. Both as to general level and relative movement the rental estimates must be regarded as among the least satisfactory of national income statistics." (N. I. Supplement 1951, p. 79). In the light of this warning, it seems to me foolhardy to pretend that these estimates are suitable for cyclical analysis. The compendium I have in mind would provide this sort of guidance among data collected on an international scale.

This type of spade work might well prove useful also in helping to shape the research program of the National Accounts Branch itself. A legislative branch of the U. N., for example, has been known to ask for a research report on a subject on which data are virtually nonexistent, such as the size distribution of income in underdeveloped countries. The compendium I suggest would reveal the woeful deficiency of the data for this purpose, and this realization might have persuaded the authorities to be more reasonable in their research request. On the positive side, such a survey would disclose areas in which the data are reliable and sufficiently comprehensive to justify international comparisons. It is wasteful of resources to try to analyze the size distribution of income in underdeveloped countries when a comparison of trends in the size distribution of income in developed countries (say, the U. S., Great Britain and Switzerland) has not been attempted although it gives promise of achieving valid and meaningful results.

And this brings me to the second suggestion: that the National Accounts Branch enlarge its conception of its role in research in contradistinction to its task of compilation. The general direction of such work was indicated by Professor Morris Copeland at the very time that the work of the Statistical Office was taking shape. Professor Copeland expressed the conviction before the 1945 Conference on Research in Income and Wealth that the formation of the U. N. "will undoubtedly stimulate international economic research. This means that international comparisons of national income and gross national product will be of much greater importance." He pointed out that "International income comparisons can be helpful in dealing with many matters. " . . . they may show the role played by the export-import trades in a nation's total economic activity, they may make possible international comparisons of productivity and living standards, and they may reveal the allocation of economic resources between consumption and capital formation in various countries, the proportion of each nation's resources devoted to producing military goods and services, its capacity to make an international economic contribution, and the response of economic activity in one country to changes in others."

Professor Copeland stressed the point that "mere totals of the national income of each country will not throw much light on questions such as these. More detailed analysis of the components of national income and of related factors is essential. Even when formal comparability in respect of definitions has been achieved, a comparison of percentage figures . . . may be misleading. And any attempt at absolute comparisons in value terms, using over-all exchange rates for conversion to a common currency unit, is hazardous. (*Studies in Income and Wealth,* Volume 10, pp. 133-4.)

Six years later much of this promise of the U. N.'s statistical work remains unfulfilled, and perhaps properly so. But may it not now be time to take a longer and firmer step down the path of international comparisons, at least to a point that penetrates below the surface of the national income estimates.

DANIEL CREAMER

Activities of the Demographic and Social Statistics Branch of the Statistical Office of the United Nations

By FORREST E. LINDER

There is not time tonight to outline in any detail all the various activities of the United Nations and the other international organizations and to show how these organizations use population and vital statistics data.

You can easily imagine the waste of professional effort, and the great burden on the separate national governments if each of these users of data was individually to request statistical information from governments, and was to make international compilations for his own needs.

Because of these considerations, the Statistical Office of the United Nations has the responsibility of centrally compiling various types of data which are generally useful — and demographic data are probably more widely used than any other single type of statistical data.

The fact that the United Nations takes this re-

sponsibility is not only an economy and a useful service, but if this central United Nations compilation is well done, it means that the major users of the information will use the same standard data and thus avoid the confusion that would be inevitable if different agencies were using different figures and estimates for the same thing.

Of course, in compiling demographic statistics for the world our duties are necessarily limited. The United Nations has no facilities nor power to go to the different countries and take censuses or register births and deaths. For these figures, we must depend on the national statistical services.

The main difficulty in making world-wide tables is that by merely requesting governments to send us certain specified demographic data, we don't get enough good data to satisfy the international needs. As a result, we are placed on the horns of a difficult dilemma.

In the first place, some of the data we get from governments are clearly very poor statistics and if we publish these poor data in the same tables together with good data, some statisticians think that we are misleading the public by the publication of figures so greatly different in accuracy and coverage.

To avoid this criticism, the first thought of everybody is simply to omit material which seems defective. But if we do this, we get just as much criticism. Even defective data, if cautiously and properly used, have some value. And we are then asked, by what right does the U. N. set itself up as an omniscient arbiter of what data analysts should or should not have at their disposal. We certainly can't know of all the ligitimate uses for data, even if they may be somewhat inadequate and less than perfect. In addition, the countries that send us data, justly complain if we fail to publish it, merely on the basis of our subjective opinion that the figures are inaccurate.

The escape from this delemma is to publish all of the data but to publish them along with detailed notes describing their accuracy. But this escape is not fully open to us, since we simply can't know everything about the accuracy of demographic data for all the numerous parts of the world.

We can, however, go a long way with this solution. We continually urge the countries to give us more facts about their facts.

The necessity of knowing more about the data which countries send us for publication leads us to undertake the difficult and continuous task of trying to make an appraisal or evaluation of the statistics. We would like to know, in the first place, the exact area to which the data relate and if any population group within that area is systematically excluded from the figures. The next question is whether the statistics, in fact, completely cover the groups that are presumed to be included, or whether there is serious underenumeration or under-registration. From these first questions of coverage, the studies must be extended to comparability of definitions and classifications. Next we should know whether or not the statistical operating procedures, such as the methods of data collection or the processing rules for coding and tabulating have introduced any major elements of non-comparability. These are mostly procedural questions. Of equal significance and importance is the question of the accuracy of the information reported for the different items of the enumeration or registration schedule. Even assuming identical definitions, classifications, collection and processing methods, how serious are differences between countries in the accuracy of the information reported for age, marital condition, occupation, cause of death and similar variables essential for demographic studies.

It is one of our objectives to make this accumulating knowledge available for the use of the consumers of international demographic data, and this is done by continually trying to improve the notes and descriptive text in the Yearbooks and by publishing handbooks and special reports on statistical practices. This knowledge about the differences in method and the varying accuracy of the statistics of the separate countries has another and potentially much more fruitful use. Such knowledge also forms the necessary foundation for a realistic programme of work which has as its ultimate goal the elimination of the major technical differences and a general improvement of the adequacy and international comparability of national statistics.

This objective of stimulating an improvement of national statistics is one of the major aspects of the work of the Statistical Office.

In any programme for the improvement of the world's demographic statistics, several other important factors appear. In the first place, many types of economic statistics appear almost automatically as by-products of administrative procedures or governmental operations, which have a reason for existence quite apart from the statistics themselves. This is true, for example, of such statistics as those relating to foreign trade or to financial transactions. In contrast to this, population statistics and, to a large extent, vital statistics, result from procedures which are established solely for the purpose of developing statistics.

From the standpoint of improving statistics, both of these situations have advantages and disadvantages. When statistics are a by-product of some procedure which exists for other reasons — the first problem of justifying the existence of the statistics is relatively easy. For the most part, the mechanism for creating the statistics already exists, and the immediate and direct uses for the statistical information usually are adequate to justify the necessary governmental expenditure to produce them. In such fields, the international activity for the improvement of statistics is primarily that of arriving at a general agreement on types of data to be presented and upon standard definitions and classifications. However, for the very reason that the statistics are the resultants of other governmental activities, it often is more difficult to make the changes in the base documents which are necessary to standardize the tabulated results.

In the demographic field, quite the contrary situation holds. A population census and the elaborate systems for collecting current registration data of vital events are not by-products of other essential governmental operations. Therefore, in this field, the international programme for stimulating improvement must be largely one of developing the full national and international use of the statistics, so that it is evident to governments that the statistics themselves justify the cost and effort of maintaining the collecting and compiling organization. Once this is done, the questions of attaining comparable items of information, and comparable definitions and classifications

are largely technical. Changes and improvements in such technical matters are not hampered by a dependent relationship with some other governmental activity whose interests and purposes are dominant.

In addition, the direction of international work for the improvement of demographic statistics is affected by another major factor. In certain fields of economic statistics, there is a strong positive correlation between the importance of a certain class of statistical data and the resources and facilities available for providing those data. For example, countries which are most important from the standpoint of international trade statistics, are those for which foreign trade is important from a national point of view and which, therefore, have developed the corresponding statistics. Countries with important production of oil, steel or automobiles tend to parallel the industrial production with the production of statistics measuring that activity.

This fortunate positive correlation is lacking in the demographic field. In this sphere, the correlation is negative. Countries with the greatest demographic problems are precisely those with the least data to study those problems. Areas with the greatest production of people (in terms of the number of births) and the greatest consumption of people (in terms of the number of deaths) are mostly those for which human production and consumption figures are least available.

These factors determine, to a certain extent, the kind of an approach which must be made to the task of stimulating the improvement of national demographic statistics.

The objectives are advanced through promotional and educational activities designed to show countries of the value of demographic data for both national and international purposes. The work includes the development of technical recommendations and handbooks which describe methods in use, and give standards for international uniformity. These aspects of the work are supported by direct technical assistance to countries and training activities to assist governments in planning, organizing and administering their demographic statistical systems.

Through these methods, we approach the problems of increasing the completeness of the statistical coverage; of improving the quality and accuracy of the data; of stimulating the extension of the statistics to new variables needed for demographic analysis; and of achieving the desired degree of standardization of definitions, classifications and tabulations.

Perhaps you will wonder whether any noticeable amount of progress is being made. A careful quantitative study of the progress made would be another task. But it is fair to say that anyone who has the opportunity to observe, at first hand, the developments in different parts of the world, will conclude that progress clearly can be seen and, in some areas, is amazingly rapid.

The progress is also observable from our offices here in New York. Through our correspondence, we can see an increased feeling of interest and an improvement in national technical work. There is evidence of national pride in sending better data for international publication, which is reflected in the serious and careful answers which we get to our queries on detailed points.

The statistical consultants which the U. N. has sent to many countries of the world; the seminars, conferences and training centres which have been organized, and even the stimulating effect of the questionnaires which are sent in order to obtain statistical data, have all contributed to an almost universal groundswell of interest and work in demographic statistics.

Discussion of Dr. Linder's Paper

I have found this to be a really exciting meeting. Those of us who work with statistics have good cause indeed to be happy over the progress of the work in the Statistical Office of the United Nations. I believe that those of us in the demographic trade have special cause for elation. Before the war, there was a Statistical Yearbook published by the League of Nations but only a brief section of it was devoted to demographic statistics.

That we now have a Demographic Yearbook in addition to a Statistical Yearbook is indicative of: (a) the increasing volume of economic, social, and demographic statistics available for an increasing number of countries; (b) the increasing recognition of the need for good statistics for purposes of policy making; and (c) the growing recognition of the interrelation of population problems and problems of world peace and security.

For the benefit of those who may not know the Demographic Yearbook, I would like to say just a few words about it. The third issue, released last month, is a little over 600 pages in length. It contains 34 tables relating to population, births, stillbirths, deaths, marriages and divorce, life tables, and migration. Basic tables are brought up to date with each issue and, in addition, a rotating scheme is followed whereby one subject is featured and treated in special detail. The second issue featured fertility and it contained data for various countries on such details as births by order of birth and age of mother. The last issue features mortality and contains data for a surprising number of countries on deaths by cause, age, and sex, and other details. In addition, there are three chapters of text devoted, respectively, to recent mortality trends, development of statistics of causes of death, and technical notes on the statistical tables. These chapters and all of the titles, headings, and stubs of the 34 tables are given in English and French.

I was glad to hear Dr. Linder emphasize the importance of appraising and evaluating the demographic data sent in by the various governments and of passing this appraisal on to the users of the data

through footnotes and symbols. I was glad to hear him say that even more attention would be devoted to this in the future. Footnotes are needed not only to flag cases of undernumeration and underregistration but also to help avoid misinterpretations of the data that might arise from differences in definition. By way of illustration I might mention one instance in the last Yearbook in which it seemed to me that an explanatory footnote was needed. This is the case of the reported number of stillbirths in Japan for the last few years. For most countries, as one might expect, ratio of stillbirths to live births is fairly constant and hence the total number of stillbirths normally does not vary greatly from one year to the next. Yet the number of stillbirths in Japan, as reported in the Yearbook, rose sharply from about 80,000 in 1946 to about 217,000 in 1950. The computed ratio of reported stillbirths to reported live births was over twice as high for 1950 as for 1946. (9.2 and 4.2 stillbirths per 100 live births.) The only footnote to these figures indicated that the figures relate to "Stillbirths Among Japanese Nationals in Japan." I would have been much puzzled about this had I not previously learned from other sources, notably Irene Taeuber's work, that induced abortions are frequently reported as stillbirths in Japan and that a large increase in abortions in recent years is to some extent reflected in the trend of reported stillbirths.

Dr. Linder did his usual good job tonight in giving a paper. A minor point that I noticed was that although the title of his paper and the name of his Branch is "Social and Demographic Statistics" his paper contained no specific mention of any social statistics other than demographic statistics. Perhaps he will tell us whether his division is in fact concerned with any social statistics other than demographic statistics and, if so, what they are.

I believe I can speak for most of the students of population and vital statistics in this country when I say that those of us in the demographic field have a deep feeling of satisfaction over the fact that Dr. Linder is chief of the Social and Demographic statistics Branch of the U. N. Statistical Office and that Dr. Hope T. Eldridge is chief editor of the Yearbook. They previously worked together in the Bureau of the Census in Washington. They know their business. Dr. Linder not only has the assistance of other able colleagues in his own division but also the willing cooperation of Prof. P. K. Whelpton, Dr. John D. Durand, Dr. V. G. Valaoras, and other staff members of the Population Division, which is only a few doors removed from Dr. Linder's division. We are fortunate to have this galaxy of talent to guide the development of world demographic statistics.

I think it would be difficult to over-estimate the importance of developing world demographic statistics. As Dr. Linder has said, data on population, births, and deaths tend to be least adequate precisely in the countries that are presenting the most acute population problems. Furthermore, there is an increasing realization that solutions to these population problems must be reached if there is to be any permanent rise in levels of living among the underdeveloped countries. One of the first steps in the approach to population problems in such areas should be, it seems to me, that of stimulating the inauguration and improvement of censuses and systems of birth and death registration. This is needed if we are to have precise knowledge of population trends in underdeveloped areas. It is also needed if the leaders and citizens of underdeveloped areas are to have a better understanding of the interrelated nature of problems of population, health, level of living, general welfare, and national security.

CLYDE V. KISER

Reflections Upon Reading Mr. Ezra Glaser's Description of Interindustry Economics Research

by RUTLEDGE VINING
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1. The object or problem, it is said, is to estimate the "total requirements for goods and services, by separate industries, from some specified list of requirements for final demand." The words in which such articles as Mr. Glaser's are expressed seem to tell the reader that knowledge which *now* exists, together with data *now* being compiled, "will allow the computation of flows of goods and services from every industry to every other industry on the table, consistent with any sustained schedule of final-demand goods and services." One reads that a technique has been devised for determining something called the industrial implications of a specified expenditure program. This latter is also called the end-item program, and advance notices refer to the apparently existing possibility, by virtue of this technique, of estimating for any given "end-item program" *the* required input for each industry, and the possibility of measuring systematically (in a sense not heretofore feasible) the adequacy of each industry's productive facilities. All of this constitutes, or is to constitute, staff work underlying the function of decision-making performed by agencies now existing or in prospect.

Decisions must be made, to be sure, and many of these will turn upon judgments relating to, say, something that may be called the required input for each *industry* for *any* given expenditure program among a set of alternative programs. But I raise the question whether any technique may be said to now exist for providing a systematic basis for decision-making of this sort. I hold that "input-output analysis" cannot yet properly be regarded as a technique for determining, as it in effect is said from time to time, systematically and comprehensively the industrial implications of a specified expenditure program. The enthusiastic statements describing this work describe not a technique but a call and a seeking for a technique, and the arrangements of data that are made in this work represent no solution of a problem but the working towards a formulation of a problem. There is no contribution to be associated with the mere filling of a table with numbers and the mere solving of a postulated set of equations. The trick comes with the making of predictive and testable statements indicating the results of alternative courses of action, and the accomplishments to date would seem to be confined to stating in varying forms this latter as an objective.

To paraphrase the remarks of Mr. Herman Wold,[2] any newly proposed method for performing a task, like this that is called the "input-output technique," resembles a technical innovation in a production process. "The stages on its way to universal acceptance include: (1) the theoretical layout of the new idea, (2) the treatment of the technical problems involved, (3) laboratory applications, and (4) applications in practice." Mr. Wold was discussing the book edited by T. C. Koopmans, *Statistical Inference in Dynamic Models,* and in this connection he remarked that the bulk of this work is concerned with (2). In my view, virtually all of the research work associated with "input-output analysis" is confined to (2). There is nothing in this work that has been made available that would strictly correspond to (3) or (4). And if one examines that which may be submitted as falling under (1), I believe he must agree the most of it would be appropriately classed under (2). A tabular arrangement of data is proposed that implies a system of equations. The greater part of the work is concerned with the technical details of computation and data-gathering. There is no theory of economic phenomena from which operational definitions are derived for the terms used in the table headings and for the analytic forms, coefficients, and variables of the equation system. All of this definition is being done *ad hoc* in the course of work upon the technical details of computation and estimation of quantities that may somehow be interpreted as specifying a grand tableau economique. Interpreted as a technique, there exists no theoretical foundation for "input-output analysis" comparable, for example, to that which exists for sequential analysis. And as economic theory there is no contribution at all. As far back as systematic discussion of economic organization goes, there has been conceptual description of the interlocking of industrial processes. As illustrations, one could refer to chapters contributed by Veblen, or by Mitchell, or by Schumpeter, or by Knight, or by scores of others. There is hardly a well-known economist since the Physiocrats that has not "conceptually" accounted for and described these industrial interlockings. "Input-output analysis" has attacked the technical problems of computation that would be presented if in fact the economy were characterized by what would seem to be a very crude scheme for these interlockings of economic units. Its strength lies not in its contribution to economic analysis. It is an instrument for doing something, viz., predicting the outcome of a course of action, and its strength has yet to be demonstrated in its ability to yield predictive statements. There exists no theoretical knowledge upon which one might base a measure of confidence that, when the definitions and operational instructions are finally decided upon and the data are gathered, the instrument will succeed in this respect. The truly remarkable outcome would indeed be this success, and that would present all sorts of theoretical problems of explanation.

In these remarks and the remarks to be made below, I do not mean to question the desirability of experimentation with particular procedures which might be looked upon as promising facilitators of prediction and control. But some of the accounts of proposed procedures seem so phrased as to give the impression that particular procedures are already known to be effective for this purpose. What the administrative agencies who are promoting this work presumably

[1] "Interindustry Economics Research," *The American Statistician,* April-May, 1951, pp. 9-11.
[2] *Econometrica,* October, 1951, p. 475.

want is technicians who are proficient at prediction and at the construction of tests and controls of the quality of procedures for decision-making. I get the impression that this proficiency is being confused with proficiency at inverting a matrix. The history of economics over the past twenty years is littered with the hulks of worn-out enthusiasms. While "input-output analysis" is not yet a hulk, it is an enthusiasm and I believe to a degree not entirely warranted by the results made available. I shall illustrate my difficulty in understanding or in accepting the statements made by the promoters of this line of work by referring to Mr. Glaser's article. Remarks will then be offered in regard to a test by which the effectiveness of the procedure might be judged.

2. Mr. Glaser quotes from a government report, "based on extensive study of the technique and comments received from a panel of experts and from other technicians, which stated, *with qualifications,* that 'both at present, and in prospect, the interindustry relations study technique is the most efficient and comphensive technique available for studying the total effects of any given program, civilian or military, on the economy and on the several industries in the economy'."

I have added the italics, and I raise the question of how one qualifies a statement of this sort – including, as it does, nothing that admits of qualification: "at present and in prospect," "most efficient and comprehensive," "total effects," "any given program," "the economy and its component parts." When the term *efficiency* is used in theoretical statistics, it is analytically defined such that a measure of efficiency is specified. So far as I can judge, no analytical meaning at all can be assigned to the terms *efficient* and *comprehensive* in the context of Mr. Glaser's statement. "Most efficient technique available" implies that other techniques exist for performing the same task and that a comparison has been made. Mr. Glaser goes on to say that the committee recommended "that other work be initiated for further testing of the technique." Later he mentions "the absence of experience in its application to actual situations" and still later he remarks that "to date there has been little experience in designing test applications of the technique, without which we cannot appraise its practical usefulness." In the light of this remark, we may ask: What was appraised by the committee, "the panel of experts and other technicians"? And what is meant by the committee's recommendation that "further testing be initiated"? That is, should not the word "further" have been left out? And if no test has been applied, how did the panel of experts and other technicians go about reaching its conclusion that the technique is the most efficient for the present and prospective future for the analysis of any given program?

A description of the present status of this work is given. The computing staff and equipment is poised. "Most if not all the computation procedures have already been developed . . . Various computation laboratories are available for the mathematical processing of the analyses . . . Very high speed computing equipment makes it practical to apply the input-output technique to quite detailed formulations of mobilization programs." And these formulations are under way. Data have been or are being gathered that "will allow the computation of flows of goods and services from every industry to every other industry on the table, consistent with any sustained schedule of final-demand goods and services." But this does not mean what it says, for the "calculation assumes 1947 technology and product-mix within each industry" and "further studies are being undertaken . . . to overcome the obvious limitations of these data." "Known changes in technology and product-mix" are being projected;" ". . . production, price and productivity indices" are being developed in order to "allow for changes in prices and industrial structure since 1947." The completion of these projects will "allow the testing of the industrial feasibility of a program which required the economic system to maintain specified levels of output for each industrial classification in the basic tables."

But this last statement does not mean what it says either; "for the significance of 'dynamic' factors is prime," and "these are not accounted for in the simple formulations suggested above . . . The most difficult problems of economic analysis and data gathering arise from these 'dynamic' elements. The application of this kind of analysis to actual mobilization situations will depend on the provision of successively better data on these 'structural' changes in the industrial system." That is to say, the statements earlier made regarding what the technique is capable of doing and the term "most efficient," used by the "panel of experts and other technicians" in its appraisal of the performance of the technique in doing it, are to be understood in their respective Pickwickian senses.

But better data are in prospect, and "studies of 'dynamic' problems have been begun." "Data will . . . be obtained on the purchases . . . implied by additions to capacity. Not only will new plants be considered, but conversion . . . , modernization, and addition to . . . facilities will be considered where appropriate." They will not be considered where not appropriate. "A study of energy needs of the economy" has been begun, and "plans are in preparation for capacity studies . . ."

There is no unique formulation of the "analytical system." There are various ways of doing things. For example, "labor requirements will be estimated from the computed levels of output of each of the industries after the input-output analysis has been completed. This is not the only alternative in the formulation of the analytical system, but the proposed method is probably capable of the earliest actual application to real problems." The rule of choice implied here is to consider the set of all possible "formulations of the analytical system" and to choose the one "probably capable of the earliest application," "analytical system" and "probably capable" being, again, taken in their Pickwickian senses.

Finally, it may "be noted that the occupational distribution and area analysis research is not an integral part of the interindustry research program at this stage. The studies could be applied to activity levels of industries however arrived at." But this does not mean what it says either, for "in practice" something or another must be done in order that "aggregation patterns" match something in the input-output table.

Mr. Glaser is as well informed as anyone about the status of this research, and, neglecting the possibility that for security reasons he is showing less than he knows, I conclude from his article that: (1) computation laboratories are ready and available; (2) data-

gathering organizations are at it tooth and claw; (3) no one knows how whatever is being tried will work out; (4) there exists no unique procedure that would qualify as a technique of analysis but only a tabular form.

As I indicated above, it is not my intention to criticize this line of work. The test of its effectiveness will come with its fruits, and these are not now generally available. My criticism is of the advance notices describing its future potentialities.

3. I would be inclined to call this approach not "inter-industry economics" but rather "inter-industry accounting," or better, "national managerial accounting" to conform with usage in industrial management. This is in no sense an invidious distinction, and I think the development of such procedures reflects the trend toward national planning that has accompanied growth in operations, just as growth has led to systematic planning procedures in large corporations.

Accounting, of course, is a much more restricted field of activity than is pure research. Research is basically an intellectual process of discovery, and one is engaged in discovering and describing relations that have never been brought to the level of consciousness before. The natures and essences of structures and processes are not already known but rather are being sought for. Entities are defined, structures are delineated, and regularities, normalities, and uniformities of the functioning of systems of these entities and structures are specified and analyzed. In accounting, on the other hand, there is a definitely stated objective or job to be done, as there is in engineering, that has been explicity specified beforehand. The features of the functioning of the *something* are already known or assumed to be known, and the job is the presentation of information facilitating the making of decisions in the management or control of that something. Records and reports are presented by which the cogent happenings of the past are mutually reconciled, the current happenings are kept under control, and the happenings of the more or less immediate future are anticipated. The managerial decisions to be made determine the definitions, the form and content of the reports, and the nature of the computations. This is staff work underlying the function of decision-making. Scientific knowledge is employed or exploited but not primarily sought. The primary objective is the facilitation of control.

The form of the table that gives direction to this that is called "interindustry economic research" fits the general idea of control or managerial accounting. This latter is to be contrasted with audit accounting, and it has been developed considerably over the past decade or so. The comptroller of a corporation assumes a task well enough described by statements that are sometimes given as indicating the objective of input-output analysis: starting with a specified end-item program, estimating the required inputs for each process, and appraising the adequacy of facilities and sources of supply in relation to the specified expenditure program. A comptroller, I believe, would accept the statement as it stands as describing his responsibilities.

A large corporation produces many different products in each of a number of plants widely dispersed geographically. The activities within each plant are considered by departments, and the output of one department constitutes inputs of various other departments. There are "exports" and "imports" to and from other corporations. Control involves the anticipation of material and service needs by department and plant and seeing to it that these needs are met at minimum cost. Something like an input-output table could obviously be constructed, and such tables perhaps are constructed and surely would be used if they could be shown to pay their way. If told what changes are to be made in the "end-item program" for the next period, the control accountant would perhaps use, in lieu of something better, the data of the recent past in roughly estimating the material and service needs for the new output. But this would be a sort of common-sense procedure — but then Mr. Glaser's procedure also reduces to catch-as-catch-can with his trend projections, guesses, alternative aggregation patterns, et cetera. If an input-output table were used and estimates of the required inputs were electronically computed, the comptroller would know that the precision of his computations adds nothing to his confidence in the goodness of his estimates. The objective is the facilitation of production by helping to see to it that what is needed is available at the time and place and at a minimum cost. The effectiveness of a particular procedure and set of forms, tables, and computations for making predictions and controlling supplies and outputs would be gauged in terms of alternative procedures for control. Input-output tables and electronic computation, made upon more or less questionable data and in accordance with instructions implied in a miserably crude model of an economy, may or may not be effective; and the test of effectiveness is a matter of whether or not there exists a cheaper procedure that will do as well in the control of operations. "Do as well" in this case involves a comparison of anticipations before the fact with the fact that comes with time for each of the alternative procedures. The strength of a given procedure is not a matter of internal consistency of computations but rather of how well it can predict quantities which managers consider will facilitate the making of their decisions. How well it can do this job is to be measured by reference to the cost of making estimates by alternative procedures in which comparable confidence may be had.

If the managing agency contemplates a change in the products it intends to procure or produce, in order to reach a final decision it requires information on "feasibility" and on the changes in purchases and sales of each classification of the producing and purchasing units. Estimates and quantitative judgments are made in accordance with some procedure, and upon the basis of these estimated quantities action is taken. In a limited sense, the procedure may be thought of as constituting a part of a rule of inductive behavior or of a decision-function, and there could be devised measures of its performance or operating characteristics. To the extent that the procedure is a reliable predictor, it will lead to good decisions. When action is taken, the predicted quantities may be compared with actual quantities. The discrepancies are errors, and the larger they are the poorer the performance of the procedure. But there is no known statistical theory by which this error can be analyzed as a property of the procedure. The theory of estimation and tests specifies for a class of situations the operations to be performed and indicates the results that will be the consequence of these opera-

tions. All the terms and relations are defined such that operating instructions may be written out, and the knowledge makes possible a prior systematic comparison of alternative procedures. But none of this is applicable in the present case. The comptroller must judge the goodness of his procedures for keeping a running estimate of future outputs and inputs of the various products and services by cumulating experience through trial and error. If simpler and less expensive procedures give estimates in which he may have no less confidence (which accumulates or decumulates with trial and error and for the prediction of which there is no known theory), then these simpler ones are better procedures.

Thus, confidence must be built up in actual experience, and the comptroller would keep a check upon the usefulness of the procedures currently employed for anticipating future quantities. I have heard a remark made to the effect that the input-output study of the 1939 economy was applied in 1946 to an analysis of the prospective economy of 1950 and that it, as it was said, successfully anticipated many of its most significant features. Perhaps this refers to a designed experiment, and possibly a full account of this experiment would illustrate the kind of test of performance that the comptroller would have to apply to his operating procedures. But as the remark is made it sounds like bad design and suggests that no test of performance was obtained. For we may ask: What is "successful" and what part of *all* is "many"? If "many" is a small part of *all*, then for all we know virtually no procedure at all may have had the capacity of doing as well.

That is, a test of a procedure like "input-output analysis" will involve a comparison of its performance with the performance of other procedures. One test of this sort of an elaborate econometric model has been made by the Cowles Commission and described in a volume published by the National Bureau of Economic Research.[3] Two methods were used for predicting a number of variables. One method involved the use of an econometric model entailing a vast amount of computation in the solutions of systems of equations. The other method was called the naive model, the simplest conceivable model – the assumption that the magnitude of the variable next year will be equal to its value in the current year. The naive model was much the more reliable predictor. One must presume that this experience has been and is being studied by the agencies subsidizing and promoting the "interindustry economic research." The designing of a test of the performance of "input-output analysis" as a predictive instrument will provide a measure of "degree of successfulness" and of the "muchness" of "many"; for some naive model may possibly demonstrate that the "many" was not enough to justify the expense.

4. Thus, it would seem that the government agencies undertaking or supporting this work can be properly looked upon only as a staff organization whose responsibility is to provide information upon which managerial decisions are to be based. The test of this staff's performance must be in terms of the quality of this information and of how much it costs to get it. When proponents of "interindustry economic research" make statements like, "Aggregation by industries is a simplification which makes input-output analysis practically feasible," they must assume the responsibility for explaining the meaning of the clause "which makes input-output analysis practically feasible." For this seems to imply that it is known to be practically feasible. By what demonstration has it been shown to be practically feasible in performing its predictive task more effectively than a less costly procedure and sufficiently effectively to pay its way? Or when they state that "In a perfect system of industrial classification, input coefficients remain stable so long as there is no technological change, and even in the presence of technological change the variation in input coefficients is for the most part gradual and single directional," it should be borne upon them that there is no operational content in such a statement. Their method reduces, when question-begging statements and undefined terms are crossed out, to almost pure empiricism. When predictions are made and compared with those afforded by other procedures, then we may judge the performance of "input-output analysis" as a predictive and control device.

Mr. Glaser ends his article with the statement that "The prognosis is sufficiently favorable, however, to justify the time and staff resources being expended on the research program." I have no specific grounds for questioning the justification of the expenditure of these apparently substantial resources. It is the meaning of words and the content of statements that concern me, and I, again, classify *prognosis* and *sufficiently favorable*, as used here, as Pickwickian in essence.

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[3] Carl Christ, "A Test of an Econometric Model for the United States, 1921-1947," and Comments by Milton Friedman, L. R. Klein, G. H. Moore, and Jan Tinbergen, *Conference on Business Cycles*, National Bureau of Economic Research, 1951, pp. 35-129. The comments of Milton Friedman provide a brief outline of the tests and the results and are particularly pertinent to the present discussion.

Reservations On Professor Vining's Reflections

by EZRA GLASER

I.

My two and a half page note in *The American Statistician* a year ago was little more than a list of the groups engaged in a systematic program of research in interindustry economics under sponsorship of the Federal Government. It took the form of an outline of the kinds of work either being done or about to begin. Professor Vining does me too much credit in using this note as a point of departure for opening a discussion of many points not treated in my article. Hence, the "Reflections" are in no sense a reply to my paper but a new start on the same general subject. Neither is this comment a rejoinder to his presentation in the sense of a rebuttal in a debate.

There is nothing inappropriate in Professor Vining's raising of questions about the nature of scientific method in economic and econometric research. These questions have been discussed before in the technical journals and elsewhere, and they will be further argued in appropriate vehicles where space allows more exacting and careful presentation than in the *Statistician*. The substantial literature on these problems includes the writings of Professor Vining himself, as well as the contributions to the development of econometric methodology or the application of mathematics and statistics to economic problems of such scholars as Leontief, Samuelson, Koopmans and other members of the Cowles Commission, among many others.

Pending more adequate treatment in technical journals, however, in this comment I will set down a few reservations on the main points in Professor Vining's "Reflections." I shall not attempt to trace the origin of these opinions back to my note of last year, since that statement was not in a methodological or theoretical context, nor was it in any sense a critical statement. In any case this task would prove difficult because of Professor Vining's free interspersing of the quotations and opinions of others into those expressed in my note. Moreover many of his misunderstandings arise from his treating all omissions in my earlier note as purposive negations.

Professor Vining devotes a section of his paper to criticism of the tone of "advance notices," and quotes extensively from my note. I will not debate these points in detail. To some extent he is right about my own account, since my brief piece intended to be informative; merely describing what would be attempted, not the success of the outcome. Whatever onus may be attached to the report of the panel of experts must be properly mine, since I quoted only a tiny fragment of an extensive and carefully considered set of documents, and he accepted my extracts as complete text. Where I do qualify major points in my exposition, he uses these qualifications to disprove the points themselves by first commenting on the unqualified text and then introducing my own cautioning text as proof of inconsistency.

II.

Professor Vining's paper makes four substantive points vital to the development of interindustry economics and economic research in general:

1. Interindustry economics offers no contribution to economics, though it may conceivably have other uses;

2. Interindustry economics can have no uses apart from "national planning" and "facilitation of control";

3. Interindustry economics has no theoretical foundations; and

4. Interindustry economics, like any other technique, cannot be appraised except by evaluating its successes and failures in practical application, and the exclusive standard is the ability to predict economic phenomena.

Each of these four points is discussed below. What I write in this comment, of course, is my own opinion and prejudice, rather than that of the Federal Government or of any government agency or any research group which participates in the project. There are wide differences of opinion between and within the several cooperating organizations on some of these problems. This is both unavoidable and desirable, so long as there is the common objective of practical application and selective appraisal of the advantages and shortcomings of the approach. It is no trick at all to find disagreement in the representations of various individuals; "inconsistency" of prognosis must be expected among independently thinking researchers.

1. Professor Vining believes that interindustry economics will offer no contribution to economics. To avoid a polemic argument based on loosely used language, for the purposes of this note I would regard this point as largely dependent on his other three points, discussed below.

I should like to state here, however, that there is some justification for regarding the identification and study of problems as a contribution to a discipline. National income analysis and other aggregative approaches make all kinds of unstated assumptions about structural relationships in the economy. There is nothing wrong about this; much useful work is accomplished by skilled practitioners of this technique. The concern of interindustry economics with structural problems as such causes some of these assumptions to be explicitly stated and discussed: production functions, product-mixes, changing processes, materials substitutions, and others. The relationships are brought into the open for study and testing, but the problems are neither new nor peculiar to interindustry economics. There is a net gain from this work of exposure and criticism of assumptions, apart from whatever other contributions the technique may be able to make.

2. Professor Vining speculates that the contribution of interindustry economics, if it does make a contribution, will lie in its use "as an instrument for doing something, viz., predicting the outcome of a course of action." Later he attributes "the development of such procedures" to "the trend toward national planning" and still later, "The primary objective is the facilitation of control." Since these quotations come from three parts of his article I may inadvertently be doing Professor Vining an injustice in bringing them into a single context. Having objected to his shifting the

context of my quotations I do not wish to misconstrue his text in the same manner.

"Planning" is a difficult word to define; given a particular sense Professor Vining is right. If "national planning" is the attempt to foresee the economic consequences of Federal programs, especially large purchases of goods and services from the industrial economy (e.g. for atomic energy, or military supplies), this objective is behind the interindustry research program. However, the discussion of controllership and accounting seems to imply interchangeability of "planning" and "control," with neither word defined. If "control" is used in some overall sense, the above point may still be partly valid: the purchase of a billion dollars worth of aircraft might be said to "control" the application of a particular quantity of productive resources to this order. When the government becomes a large buyer this phenomenon becomes important. However "control" might relate to much more specific administrative measures concerning a single industry or even a single company or plant. There appear to be technical characteristics of interindustry economics which make such uses unlikely.

In the first place the definition of an industry is a highly artificial concept. The productive process is broken at arbitrary points and goods are said to be shipped from one to another "industry." In some cases, goods may be repeatedly sold and go through a number of industrial processes and yet remain within an "industry." Since the conceptual framework and the data of interindustry economics systematically exhaust the entire economy, this classification and aggregation process introduces no errors of omission or double counting. Valid manpower and resource requirements may be derived for the entire economy, if all the relevant data are subject to a uniform classification and aggregation system. (This sentence should not be taken to mean that all estimates have zero error.) However, there may be no analytical category corresponding to what an administrator of a "control" program might call an industry. Many related problems, such as secondary products (rolled copper products made in the iron and steel forging industry) and by-products (glycerine made in the soap-making process) make an interindustry analysis an ill-adapted device for "control" of individual industries.

In the second place, the use of the interindustry data and technique in making an administrative decision for a single firm or plant would be fraught with further dangers. At the very least it would have to be assumed that the firm or plant had the same product-mix (percentage distribution of values of its various products) as the industry to which it had been assigned, or that it had the average cost structure of the industry even if its product-mix was atypical.

The use of interindustry economics for "control" in this sense would present many more problems, but this is not the appropriate place for their detailed discussion.

3. Professor Vining protests that interindustry economics is not based on "theoretical knowledge." I cannot argue the matter since he does not define the term and I see no advantage in offering a definition that would justify its use in this work. But he does give a definition of "research" and not an objectionable one at all. In this discussion he states, among other things, "Entities are defined, structures are delineated, and regularities, normalities, and uniformities of the functioning of these entities and structures are specified and analyzed." I can find nothing inconsistent between this statement and the objectives of the interindustry economics research program of the Federal Government.

Interindustry economics is concerned with the identification and measurement of economic relationships. This work is accomplished in part by bringing to economics ideas which are almost commonplace in engineering, where the relationships are used individually. The contribution of economics is the construction of a class of analytical systems which serve to cover a specified domain of economic activity and deal with meaningful economic problems.

Interindustry economics might better be called an approach than a method or technique. The common element in all attempts at practical application will be the attempt systematically and consistently to account for the generation of indirect (interindustry) demand. Systematically, because of internal and external checks: everything that is bought must be sold, and estimates of the total value of product and of various GNP components and good quality trade information must be matched in the correct totals. Consistently, because each transaction is counted once and only once and is classified (with some errors, of course) into the appropriate Standard Industrial Classification, for each product or class of products identifiable in the most detailed sources.

Professor Vining calls attention to the absence of a "unique formulation." He complains that "There are various ways of doing things." This is so. I trust that the interindustry technique will be applied to a variety of problems and that we will presently have some experience in correct and useful techniques and procedures — learning by mistake where necessary. A number of universities and other organizations which are interested and active in research on economic models will use the data developed by the Government agencies and other cooperating groups for their own research. Undoubtedly there will be many kinds of applications or "formulations" and I presume that a wide variety of models — some cautious, some rash — will result.

Let it not be presumed from my exceptions to Professor Vining's remarks that I believe an economic model, particularly an interindustry economic model, can do no wrong. Even before any further experience (or any at all with detailed data) some difficulties can be foreseen. The operating process in the contemporary American economy is suffused with flexibility and adaptability of many kinds. It may be some time before we can appraise the skill of model builders to reproduce this flexibility in a behavioristic numerical analogue of the actions of economic units, even for some limited selected domain of the economic system. This is not the place to trade speculations on this question, though the problem is bound to remain a real one.

Another pervasive and persistent problem is the dependence of a model on the level at which statistical summarization takes place. Again, in a vehicle which will allow sufficient space, opinions and experience will be offered for criticism and comment.

I cannot now say to what extent "theoretical knowledge" is sufficient to construct these analytical systems

and overcome the difficulties mentioned above, among others. Certainly there is an indisputable mathematical foundation for interindustry economic models; the question is to what extent the economics stands firmly on this base.

4. Professor Vining correctly contends that little can be concluded concerning the value of a technique until it has been practically applied. He holds ". . . that input-output analysis cannot yet properly be regarded as a technique for determining, as it in effect is said from time to time, systematically and comprehensively the industrial applications of a specified program." Later, ". . . its strength has yet to be demonstrated in its ability to yield predictive statements." Again, ". . . input-output analysis . . . is an enthusiasm and I believe to a degree not entirely warranted by the results made available." Finally, "Confidence must be built up in actual experience." Professor Vining seems to feel that these sentiments are in opposition to my article in which I spoke of the ". . . attempt to test the application of the technique to mobilization problems." Again I said, "The project is still classified as research because of the absence of experience in its application to actual mobilization situations . . ." and "To date there has been little experience in designing test applications of the technique, without which we cannot appraise its practical usefulness."

Although there has been some small amount of work that might be classed as "experience," it has not had the benefit of recent detailed data. Professor Vining's article, in failing to distinguish between my account of the research and other sources, creates some confusion on this point. My article made it clear that even the basic tables were not then available. They have now been completed and have been published in 50-industry detail by W. Duane Evans and Marvin Hoffenberg.[1]

Plans for "laboratory application" include the construction of one model which attempts a few simple refinements, and several "equilibrium" models for comparison purposes. While the mathematical characteristics of these first trials are simple, the 190-industry detail causes large data-handling problems. None of these models have been completed, so it is much too early to question whether the approach has proved its worth. Mr. Wold's last stage "applications in practice" is therefore entirely in the future. Only a rash man would now attempt to specify the classes of meaningful economic problems for which the technique will prove useful, even if there were a lesser goal than "universal acceptance." (What techniques of economic analysis are "universally accepted"?)

Professor Vining offers the test of verifiable prediction as the only device for appraisal of economic analysis. It is indeed an effective method where possible, but economics is a non-laboratory study, and most of its problems are not subject to such neat tests. Prediction is a subtle matter. Even simple conceptual problems may prove unsurmountable: you may predict the FRB index of production, but does this prove you have predicted the correct amount of production in the exact sense of your problem? Professor Vining correctly calls attention to interpretive problems of appraisal if a prediction should come out close. The evaluations are at least as difficult if the prediction misses the goal, for we are testing the gun, the ammunition, and the shooting range all at once.

The rapidly growing technical literature on economic models has concerned itself with all kinds of theoretical formulations (by which I mean logical-symbolic treatment devoid of actual statistics which represent something in the economy) and all kinds of economic, econometric, and measurement problems. Nothing could be more satisfactory than a model which was so general and so accurate an analogue of the actual economic system that (1) any phenomenon of the real economic system had a numerical counterpart in the model; and (2) the two were in very close correspondence wherever the actual phenomenon could be measured.

I suspect that no sane statistician (I hope this is not a null class) would ever think of trying to set up such an econometric model. At this stage we should be happy to find that we had a highly correlated analogue to some particular variables important to the problem at hand. Perhaps this is what was in the mind of the speaker who hoped, in Professor Vining's quotation, that he had anticipated many of the most significant features of the 1950 economy. Since no two problems generate the same burden of prediction, a model might predict some variables fairly well (by some standard) and be far off on others. All-inclusive economic models are not the only way to use or test the interindustry approach.

There is a meaningful class of problems in which the answer is not in the form of a prediction in the sense that the actual phenomena can be impartially observed, measured, and compared with a theoretical value. Among such problems is the expected performance of some one component of the economy under specified conditions (indirect impact of purchase of a military truck on the coke industry); but this precise set of conditions cannot be actually created in the real world. The research I outlined is aimed at the construction of a number of models, some relatively complex and some not. I should like to use Professor Vining's term "naive," but like the words "simple" and "elementary" in mathematics it may prove a booby trap. The appraisal of such models will be subtle and difficult, and will not be discussed here. The assumption that next year will be like this one is obviously a happy one for a period of slow change, but I am not sure it is "naive" in this context. If such a model were postulated for explosion of full-scale war on a January first, then the model would be at least "naive," probably foolish. A prediction of slow change (or pervasive stability?) per se does not seem "naive" to me; it might prove most shrewd, or stupid, depending on circumstances.

I have mentioned above the considerable flexibility and adaptability of the interindustry approach to various problems. This is the subject of explorations of interested economists whose work is yet to be accomplished and appraised. Only a much wiser man than I could prejudge the outcome of these experiments and separate in advance the useful from the futile applications.

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[1] Evans, W. Duane, and Hoffenberg, Marvin, "The Interindustry Relations Study for 1947," monograph presented and distributed at the annual meeting of the Econometric Society in December, to be published in the May issue of the *Review of Economics and Statistics*.

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CHAPTER NOTES

CENTRAL NEW JERSEY

The March meeting heard L. R. Tucker, Vice-President of the Chapter, speak on a "Program of Statistics for the Selective Service College Qualification Test of May-July 1951."

The April meeting of the Chapter heard Harlan H. Miller of Trenton State Teachers College speak on the Formation and Uses of Census Tract in the Trenton Area.

CLEVELAND

The April 8 meeting of the Chapter heard Aryness Joy Wickens, Deputy Commissioner of the Bureau of Labor Statistics and President of the American Statistical Association, speak on "An Analysis of the Revised Wholesale Price Index and Problems Resulting From Its Revision." The meeting was sponsored by the Business Statistics Section of the Cleveland Chapter and the Cleveland Chapter of the American Marketing Association. Mrs. Wickens and John Firestone, Regional Price Economist of the Bureau of Labor Statistics at Chicago, remained after the speech to answer questions about the wholesaale price index.

CONNECTICUT

The March meeting heard a speech by F. L. Strodtbeck of the Sociology Department of Yale University. His topic was "Representing the Outcome of Successive Rankings of Three Alternatives."

COLUMBUS

The February meeting heard Herbert S. Parnes of the Ohio State University discuss the problems of "Measuring Manpower Resources in Local Labor Markets."

DENVER

The February meeting heard a speech by Roy Flaten of the Rocky Mountain Arsenal who has been doing some new and interesting work on "Sampling by Variables."

HAWAII

The February meeting was a dinner at which Robert C. Schmitt spoke on the methods of maintaining continual intercensus population estimates. As the result of discussion after the speech the Chapter decided that it should be responsible for the construction of tables to convert police, fire, insurance, tax and other districts to census tracts. All of the members of the Chapter present agreed to cooperate on this project in order to improve accessibility to regional data.

PHILADELPHIA

The February meeting heard Dr. William R. Leonard, Director of the Statistical Office of the United Nations, discuss problems of gathering and using statistics of international significance. The title of Dr. Leonard's paper was "International Statistical Problems."

The March meeting was devoted to a discussion of "Recent Economic Developments" by Irwin Friend, Chief of the Business Structure Division of the Office of Business Economics in the United States Department of Commerce.

ST. LOUIS

The January meeting of the St. Louis Chapter was devoted to a discussion of "Data from the 1950 Census and Plans for Their Analysis," by Edward B. Olds, Director of Research at the Social Planning Council.

The February meeting discussed the need for and the problems of preparing a statistical handbook. The session was called "Cookbook for the Millions" or "Applied Statistical Handbook." James H. Batchelor spoke on "Why Do We Need a Handbook?", Guy Freutel discussed "What Should Be In It?", and Waldo A. Vezeau discussed "How Should It Be Presented?"

The March meeting heard Arthur Meyers, Assistant Professor of Economics at St. Louis University and Statistical Consultant to the St. Louis Police Department speak on "Statistics as a Tool of Government."

Lester S. Kellogg, Economist at Deere and Company, and former Secretary of the American Statistical Association, spoke at the April meeting on "Statistics —Use Them or They'll Control You." Mr. Kellogg discussed the problems of collection, maintenance and interpretation of statistical series and the responsibilities of statisticians and business management in these problems.

The Chapter had a special meeting on April 16 at which Jesse Cutts, Chief of the Branch of Industrial Prices, Bureau of Labor Statistics, spoke on the recent revision of the Bureau of Labor Statistics wholesale price index. Of particular interest were Mr. Cutts' remarks on how the new price index can be incorporated into the escalator clause of the existing supply contracts.

A special committee of the St. Louis Chapter has been working for several months on developing recommended standards for the position of Director of Public Health Statistics for the City of St. Louis. The qualifications were outlined by a committee consisting of Edward B. Olds, Dorothy Burke, Arthur Meyers, Barbara Hixon, Clyde Bridger and Robert Tschudin.

WASHINGTON

The March meeting was devoted to a discussion of labor force surveys in European countries. A group of European statisticians in Washington to attend a conference sponsored by the Mutual Security Agency and Organisation Europeenne de Cooperation Economique spoke on the status of labor force surveys in their countries. The panel of speakers consisted of Raymond Levy-Bruhl, Chief, Statistical Division of the Ministry of Labor in France; Kjeld H. Bjerke, Chief of Division of the Central Bureau of Statistics in Denmark; Giovanni Lasorsa, Professor of Statistics and Director of the Institute of Statistics at the University of Bari in Italy; Guido Galeotti, Professor at the University of Rome, Italy; and Filippo Emanuelli, Head Actuary of the National Institute of Insurance in Italy.